

3.10

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3.10 Water Quality and Storm Water Runoff

3.10.1 Regulatory Setting

3.10.1.1 Federal

Point source pollution is a single identifiable source from which pollutants are discharged, such as a pipe, ditch, ship or factory smokestack.

Nonpoint source pollution is caused by rainfall or snowmelt moving over and through the ground, picking up and carrying away natural and human-made pollutants, including pollutants present on the ground from air deposition, and depositing them into receiving waters.

The Federal Water Pollution Control Act, commonly referred to as the Clean Water Act (CWA), is the primary law covering water quality. The intent of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point and nonpoint pollution sources, providing assistance to publicly owned treatment works for the improvement of wastewater treatment, and maintaining the integrity of wetlands. Section 303(d) of the CWA requires states, territories, and authorized tribes (collectively referred to as "states") to develop lists of waters that do not meet water quality standards established by the states to protect public health and serve the purposes of the CWA (EPA 2011). Waters that the states have included on these lists are often known as "303(d) listed". Section 303(d) of the CWA also requires states to prioritize the 303(d) listed water bodies and develop and issue Total Maximum Daily Loads (TMDLs) for these water bodies. EPA defines a TMDL as a "calculation of the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards" (EPA 2011).

ODOT projects that require a CWA Section 404 permit from the U.S. Army Corps of Engineers (Corps) must also receive a CWA Section 401 water quality certification from the Oregon Department of Environmental Quality (DEQ). A Section 404 permit regulates dredged or fill materials into water bodies. The 401 water quality certification is meant to ensure that activities meet water quality standards and policies established by the state under the CWA. These CWA requirements are discussed in more detail in Section 3.12.

In addition to a CWA Section 401 water quality certification, projects exposing 1 acre or more of dirt need to comply with CWA Section 402. CWA Sections 401 and 402 establish the National Pollutant Discharge Elimination System (NPDES), which requires a permit for the discharge of any pollutant into waters of the United States. ODOT holds an NPDES permit. It requires that ODOT adopt an erosion control plan prior to ground-breaking, if construction of a project would disturb more than one acre of land.

3.10.1.2 State

ODOT has a set of goals and objectives for project construction that, when achieved, would contribute to the protection and improvement of the waters of the state. These goals and objectives are described in *Highway Division Project Delivery Leadership Team Operational Notice PD-05: Water Quality Mitigation and in ODOT Storm water Management Program Technical Bulletin GE08-02(B)*. The technical bulletin provides standards and guidelines for managing storm water runoff flows to pre-project conditions to protect receiving water bodies. The technical bulletin also contains preferred treatment BMPs that provide the most benefit with respect to both water quality and storm water runoff volume and flow reduction.

3.10.1.3 Local

Both the City of Medford and Rogue Valley Sewer Services (RVSS) hold Phase II NPDES MS4 permits. As part of these permits the City and RVSS have Storm Water Management Plans that they are required to follow that implement, among other things, construction and post-construction phase storm water management requirements. The City and RVSS have established guidelines and requirements for construction erosion control and post-construction storm water management to protect receiving water bodies. These include ordinances to prohibit pollutant discharges to storm sewers and detention requirements for up to the 10-year storm event. Jackson County regulates development within riparian areas. It requires that structures and grading be kept at least 50 feet away from streams that provide habitat, such as Bear Creek.

3.10.2 Affected Environment

3.10.2.1 Water Quality

All streams within the API have poor water quality and stream health and have been altered by diking and channelization. The API used for water quality and storm water runoff is the same API used for the analysis presented in Section 3.9, Floodplains, as shown in Figure 3.9-1. The 11 streams in the API are listed previously in Section 3.9.2.1 and depicted in Figure 3.9-1. Additionally, the Rogue River receives some storm water runoff from the project area via tributaries that are outside of the API. Large woody debris, side channels, and mature, woody riparian vegetative cover are absent from the majority of streams in the API. Riparian areas are generally narrow along streams. Rip-rap and lawns have deteriorated much of the riparian vegetation, which is largely dominated by Himalayan blackberry. Elevated temperatures, bacteria, and sedimentation are the most common water quality problems. The absence of large, shade-producing trees has contributed to elevated temperatures. Elevated bacteria levels are largely attributed to animal excrement.

Table 3.10-1 summarizes the existing water quality problems of streams within the API. Table 3.10-1 lists streams with TMDLs or that are 303(d) listed, and the specific pollutants for which the TMDLs or 303(d) listing applies. Other observed water quality conditions that have been identified for these streams that are not included in the TMDLs or 303(d) listings are also summarized in the table. Of all of the TMDL and 303(d) pollutants listed in Table 3.10-1, sediment is the pollutant most closely tied to highway runoff.

3.10.2.2 Storm Water Runoff

Soil conditions are a main contributor to storm water runoff patterns in the API. Soils in the project area are mostly clays that tend to drain poorly and tend not to erode. The tendency to drain poorly allows more storm water to reach surface water bodies.

Storm water from existing OR 62 currently flows off the side of the road into vegetated ditches or is piped to nearby creeks. Roadside ditches in the southern portion of the API provide some storm water treatment, but are primarily designed for conveyance. Near I-5, gutters and a storm water drainage system convey storm water to Bear Creek. A pond at Hilton Road detains and treats storm water runoff from a portion of I-5. Much of the storm water runoff from undeveloped areas in the API ponds and eventually evaporates, due to the tendency of the soils to drain poorly and the generally flat topography.

For further information regarding water quality and storm water, including citations to source documents, refer to the *OR 62 Corridor Solutions Project Water Resources Technical Report*. May 2011. This report is available from the ODOT contact person identified on page i of this EIS.

Total Maximum Daily Load, or TMDL, is a calculation of the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards.
303(d) criteria are established by the State of Oregon to determine if a stream meets water quality criteria set forth in Section 303(d) of the CWA. Streams that do not meet 303(d) criteria are considered impaired.

Table 3.10-1 Water Quality of Streams within the API

Stream	TMDL Issued For:	303(d) Listed For:	Other Observed Water Quality Conditions
Bear Creek	<ul style="list-style-type: none"> • Temperature • Bacteria • Dissolved Oxygen • Phosphorous • Ammonia Nitrogen 	<ul style="list-style-type: none"> • Sedimentation 	<ul style="list-style-type: none"> • Poor riparian conditions
Lone Pine Creek	<ul style="list-style-type: none"> • Temperature • Bacteria • Dissolved Oxygen • Phosphorous • Ammonia Nitrogen 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Poor riparian conditions • Sedimentation • Concrete lined in some sections
Upton Creek	<ul style="list-style-type: none"> • Temperature • Bacteria 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Poor riparian conditions • Sedimentation • Algae • Piped underground in some sections
Swanson Creek (north and south)	<ul style="list-style-type: none"> • Temperature • Bacteria 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Poor riparian conditions • Sedimentation
Whetstone Creek	<ul style="list-style-type: none"> • Temperature • Bacteria 	<ul style="list-style-type: none"> • Bacteria 	<ul style="list-style-type: none"> • Poor riparian conditions • Sedimentation
Jack Creek (north and south)	<ul style="list-style-type: none"> • Temperature • Bacteria 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Poor riparian conditions • Sedimentation • Algae
Unnamed Tributaries to the Rogue River ¹	<ul style="list-style-type: none"> • Temperature • Bacteria 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Poor riparian conditions • Sedimentation
Little Butte Creek tributaries	<ul style="list-style-type: none"> • Temperature • Bacteria 	<ul style="list-style-type: none"> • Dissolved Oxygen • Sedimentation 	<ul style="list-style-type: none"> • Poor riparian conditions

Notes:

¹The drainage basin for these tributaries is within the API, but the streams would not be crossed by the project footprint.

Source: DEQ 2007; DEQ 2008; DEQ 2010

3.10.3 Environmental Consequences

3.10.3.1 Direct Impacts

Impervious surface is the primary contributor to direct impacts on water quality and storm water runoff from highway projects. Impervious surfaces allow more storm water to reach receiving water bodies, picking up pollutants along the way. Water quality impacts, such as scoured stream beds and increased pollutant loads, result and are generally directly proportional to the increase in impervious surface area. Water quality pollutants typical to highway runoff include sediment, hydrocarbons, metals (particularly copper); and other toxic compounds that settle out of the air (e.g., mercury, chlorinated hydrocarbons, phthalates).

Traffic volumes and congestion also impact water quality. Higher traffic volumes and congestion emit more total pollutants into the air or directly onto the pavement. Storm water runoff washes these pollutants to receiving streams, impacting water quality.

No Build Alternative

Average Daily Traffic (ADT) on OR 62 in the project area is increasing over time, leading to more traffic congestion and delays. These trends would continue in the No Build Alternative, as described in Section 3.1.3.1. Pollutant loading on roadways would likely increase from increased traffic congestion, compared to existing conditions. Due to limited treatment of storm water on existing OR 62, the pollution entering streams would increase over time.

Build Alternatives

SD Alternative

The SD Alternative would construct new impervious surface within all stream watersheds in the API. The SD Alternative would construct 106.5 acres to 108.6 acres of net new impervious surface within the API, depending on the design option chosen. Additionally, the SD Alternative would re-direct 5.0 acres of existing impervious surface from the Lone Pine Creek watershed to the Upton Creek watershed. Table 3.10-2 summarizes the impervious surface area that would be created by the SD Alternative by drainage basin. The SD Alternative would manage all net new and the majority of the replaced or existing impervious surface within the SD Alternative footprint with treatment and flow control BMPs according to ODOT standards. These BMPs are designed to remove petroleum hydrocarbons, pesticides, suspended solids, nutrients, and dissolved metals and reduce flow rates of storm water runoff to pre-project levels. Increased storm water volumes may still impact receiving streams; however the BMPs would likely include amended soils to improve infiltration capacity and manage storm water volumes to reduce those impacts.

The design refinements for the FEIS will result in 13 fewer acres of net new impervious surface. The Preferred Alternative will include 95.6 acres of net new impervious surface. Table 3.10-2 summarizes the impervious surface area that will be created by the Preferred Alternative by drainage basin.

Although there would be a net increase in the amount of storm water runoff treated as a result of the SD Alternative, pollutant loadings to receiving water bodies resulting from roadway runoff could increase compared to existing conditions and the No Build Alternative because:

- An increase in ADT is expected.
- There would be an overall increase in pollutant generating impervious surface.
- Treatment facilities are only proposed and required by ODOT design standards for the new OR 62 alignment, although the existing roadways would continue to be utilized.
- BMPs would not be able to remove 100 percent of storm water pollutants.

Impervious surfaces are mainly constructed surfaces such as rooftops, sidewalks, roads, and parking lots, covered by impenetrable materials such as asphalt or concrete. These materials seal surfaces, repel water, and prevent precipitation from infiltrating soils. Soils compacted by urban development can also be highly impervious.

Water quality **BMPs**, typically state-of-the-art technology, are designed to prevent or reduce impacts. They represent physical, institutional, or strategic approaches to environmental problems. When used for water quality, they typically are used to reduce the pollutant content and/or detain the flow of a storm water discharge.

The SD Alternative is not expected to directly impact TMDL pollutants of project area streams listed in Table 3.10-1 since the TMDL pollutants are different from the pollutants typically associated with highway runoff, shown previously in this section. The increase in impervious surface would, however, provide an efficient pathway for storm water runoff that could contain bacteria or other TMDL pollutants to receiving streams. Mature riparian vegetation is mostly absent from the project area, so the SD Alternative is not expected to noticeably impact stream temperatures. Sedimentation, which is a 303(d) pollutant for Bear Creek and Little Butte Creek tributaries, is a typical highway pollutant. Although some increase in pollutant loads including sediment are expected, the water quality treatment and flow control BMPs would reduce impacts below the level of significance.

DI Alternative

The DI Alternative would have similar impacts on water quality and storm water runoff as the SD Alternative. It would create 104.7 acres to 106.9 acres of net new impervious surface within the API; approximately 1.7 acres less than the SD Alternative. Table 3.10-2 summarizes the impervious surface area that would be created by the DI Alternative by drainage basin. All other impacts described above for the SD Alternative would be the same for the DI Alternative. The DI Alternative is more constrained than the SD Alternative due to more dense existing infrastructure that could make it more difficult to incorporate storm water BMPs into the design.

Design Options

Impacts from the design options would be the same for either build alternative. However, depending on the design option chosen, there would be minor differences in the amount of net new impervious surface created. These differences are summarized in Table 3.10-2. Design Option C would create the most net new impervious surface. It would create 2.1 acres more than Design Option B and 0.8 acres more than Design Option A.

These differences are minor and the level of impacts on water quality and storm water would be the same, regardless of the design option chosen.

Table 3.10-2 Impervious Surface Area (Acres) by Alternative and Drainage Basin¹

		SD Alternative						DI Alternative					
Drainage Basins	No Build Alternative (Existing)	Design Option A		Design Option B		Design Option C (Preferred Alternative)		Design Option A		Design Option B		Design Option C	
		Total ²	Net New	Total	Net New	Total	Net New	Total	Net New	Total	Net New	Total	Net New
Bear	47.1	61.1	14.1	61.1	14.1	61.1	14.1	59.5	12.5	59.5	12.5	59.5	12.5
Lone Pine	6.1	1.1	-5.0	1.1	-5.0	1.1	-5.0	1.1	-5.0	1.1	-5.0	1.1	-5.0
Upton	8.2	43.2	35.0	43.2	35.0	43.2 37.1	35.0 28.9	43.1	34.9	43.1	34.9	43.1	34.9
Swanson	5.6	30.0	24.4	30.4	24.8	30.1 24.4	24.5 18.9	30.0	24.4	30.4	24.8	30.1	24.5
Whetstone	25.0	37.5	12.5	36.0	11.0	38.2 36.9	13.2 11.9	37.5	12.5	36.0	11.0	38.2	13.2
Jack	7.8	10.9	3.1	10.6	2.9	10.9	3.1	10.9	3.1	10.6	2.9	10.9	3.1
Tributaries to Rogue	8.0	9.1	1.1	9.1	1.1	9.1	1.1	9.1	1.1	9.1	1.1	9.1	1.1
Little Butte	7.3	29.9	22.6	29.9	22.6	29.9	22.6	29.9	22.6	29.9	22.6	29.9	22.6
Total ^{2,3}	115.1	222.8	107.8	221.4	106.5	223.6 210.5	108.6 95.6	221.2	106.1	219.8	104.7	222.0	106.9

Notes:

¹Represents impervious surface area within the project footprint.

²Total includes net new impervious surface plus existing impervious surface

³Totals may not add up due to rounding.

Source: Water Resources Technical Report

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JTA Phase

The JTA phase would create the same type of impacts common to both build alternatives, except that the redeveloped and net new impervious surface would be less. Although minor, the JTA phase design options would have different impacts. These differences are summarized in Table 3.10-3. JTA phase Design Option A would create the most net new impervious surface. It would create 1.6 acres more than JTA phase Design Option B and 0.1 acres more than JTA phase Design Option C.

The design refinements that are included in the FEIS result in 13.6 fewer acres of net new impervious surface with the JTA phase. Table 3.10-3 summarizes the impervious surface area that will be created by the JTA phase by drainage basin.

The JTA phase would incorporate the same type of treatment and flow control BMPs as discussed under the SD Alternative. These BMPs would manage storm water runoff from all net new and the majority of the existing impervious surface within the JTA phase footprint. Although some increase in pollutant loads are expected, the water quality treatment and flow control BMPs would reduce impacts such that perceivable differences in water quality and flow in receiving streams are not anticipated. Stormwater management facility locations for the JTA phase are shown in Figure 3.10-1.

Stormwater treatment will achieve pollutant removal to the maximum extent practicable by treating runoff from 94% of the contributing impervious area with preferred BMPs including bioretention ponds and water quality planters.

Table 3.10-3 Impervious Surface Area (Acres) for the JTA Phase

Drainage Basins	Design Option A		Design Option B		Design Option C (Preferred Alternative)	
	Total	Net New	Total	Net New	Total	Net New
Bear	53.6	6.5	53.6	6.5	53.6	6.5
Lone Pine	1.1	-5.0	1.1	-5.0	1.1	-5.0
Upton	35.3	27.0	35.3	27.0	35.3 29.1	27.0 20.8
Swanson	23.2	17.6	23.3	17.7	22.8 17.1	17.2 11.6
Whetstone	34.8	9.8	33.0	7.9	35.1 34.1	10.0 9.0
Jack	8.5	0.8	8.6	0.9	8.5 7.7	0.8 0.0
Tributaries to Rogue	8.0	0.0	8.0	0.0	8.0	0.0
Little Butte	7.3	0.0	7.3	0.0	7.3	0.0
Total ¹	171.7	56.6	170.1	55.0	171.6 158.0	56.5 42.9

Notes:

¹Totals may not add up due to rounding.

Source: Water Resources Technical Report

Figure 3.10-1

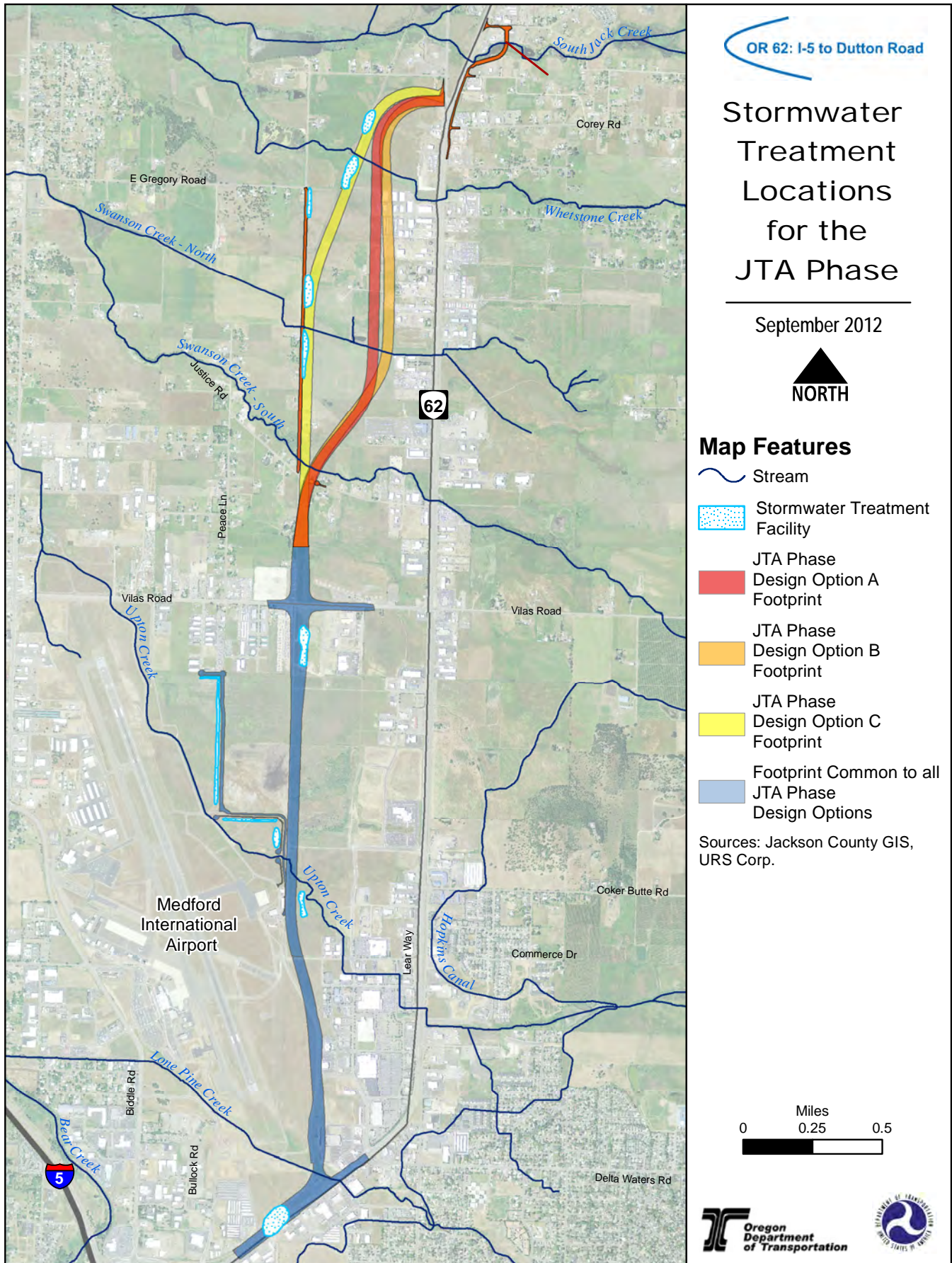
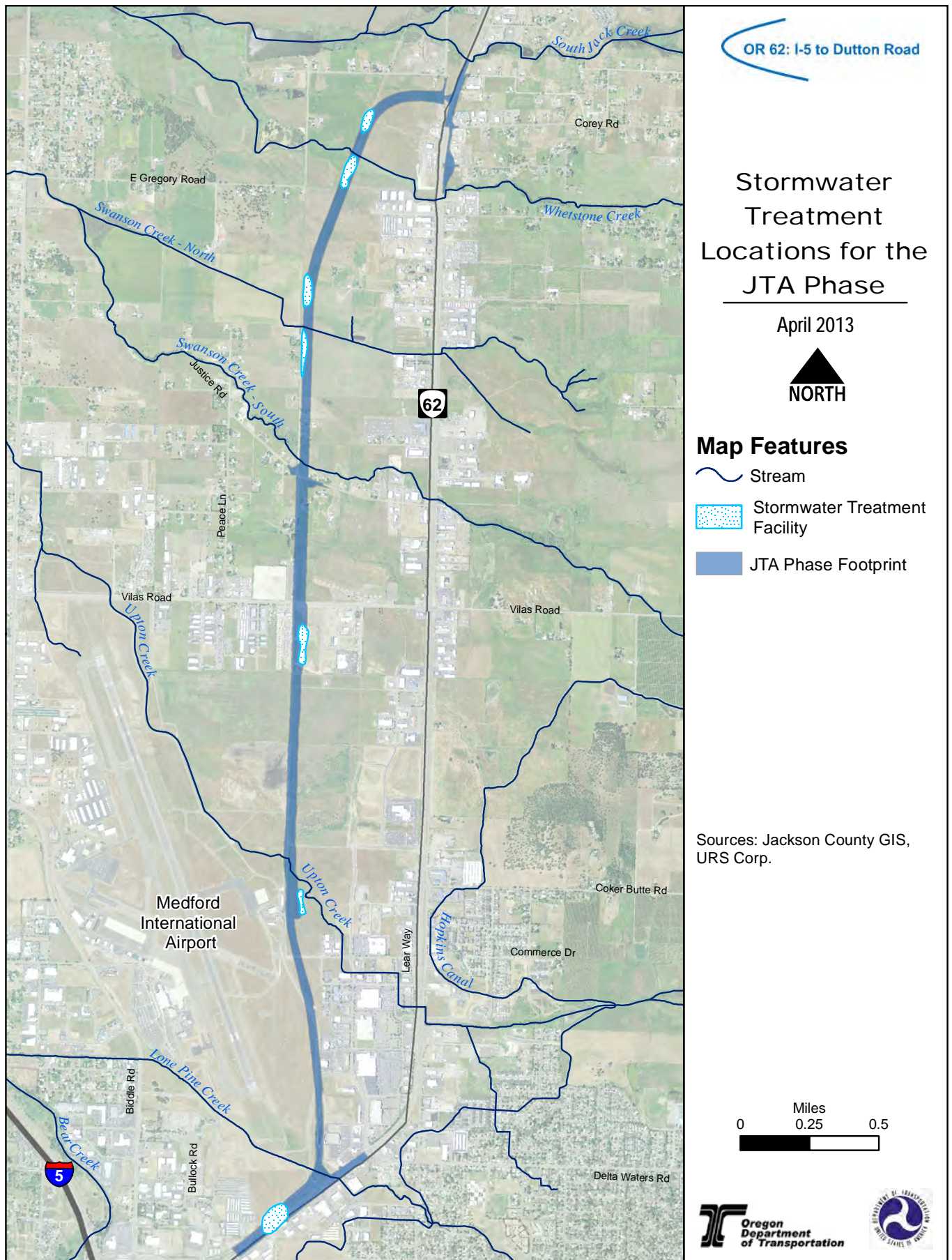


Figure 3.10-1 FEIS



3.10.3.2 Indirect Impacts

No Build Alternative

As described in Section 3.2, build-out of the land within existing UGBs of Medford and Eagle Point and the White City UUCB would likely occur under the No Build Alternative, but plan amendments and zone changes to allow larger-scale development would be constrained. This development, although constrained, could increase impervious surfaces and consequently increase storm water volumes and pollutant loads. Within the City of Medford, some of these impacts would be reduced using storm water treatment and flow control BMPs.

Build Alternatives and JTA Phase

As described in Section 3.2, Land Use, the build alternatives and JTA phase could accelerate land development allowed by the Medford, Eagle Point, and Jackson County comprehensive plans, including within the White City UUCB, and reduce constraints on plan amendments and zone changes to allow larger-scale development within the Medford and Eagle Point UGBs. Such larger-scale development would lead to increased storm water generation, but not necessarily more than under the No Build Alternative. The installation and operation of required storm water treatment BMPs is expected to prevent significant impacts.

The addition of storm water collection infrastructure could alter the hydrologic conditions of vernal pools adjacent to the project. Vernal pools rely on surface and shallow subsurface hydrology, which influence when and how long the pools are inundated with water. This in turn could have an effect on the quality of the habitat and the ability to function in a manner supporting species that thrive within them. See Section 3.12 for additional potential vernal pool impacts.

3.10.3.3 Construction Impacts

No Build Alternative

Under the No Build Alternative, there would be no construction impacts.

Build Alternatives and JTA Phase

The type of construction impacts from the build alternatives and JTA phase would be the same; however, the magnitude of impacts from the JTA phase would likely be less since the JTA phase would involve less ground disturbance. The project must conform to the ODOT construction storm water permit, which requires the use of erosion and sediment control BMPs. The generally flat terrain should make erosion and sediment control BMPs relatively easy to select and design to the site, and effective when used. Clay-rich soils would require special attention to turbidity control. This can be achieved by using filter cloths and vehicle tracking controls for site work; limiting work during wet periods, if possible; treating dewatering water with flocculants, if necessary; and properly discharging the treated waters to ground away from wetlands or, with authorization, to sanitary sewers. Potential impacts from in-water work include temporary sedimentation and increases in turbidity that could occur due to streambed disturbances during construction. During construction, measures would also be implemented to prevent spills and leaks from construction equipment.

3.10.4 Avoidance, Minimization, and/or Mitigation Measures

ODOT's storm water management program is presented in the ODOT Storm Water Management Program Technical Bulletin GE09-02(B). This bulletin presents: the triggers for the requirement of storm water treatment on a project; ODOT's water quality goals and objectives; water quality and flow control design storm criteria; "preferred" storm water treatment BMPs and integration of storm water management into the project development process. As described in Section 3.10.3.1, the project incorporates water quality and flow control BMPs according to the standards in the GE09-02(B) bulletin. No major constraints have been identified that would limit stormwater treatment within the project such that off-site water quality mitigation would be warranted.

A **treatment train** is the application of multiple water quality BMPs in series in order to achieve improved storm water quality.

Pervious pavement is a type of pavement that is engineered to allow water to infiltrate through to the ground beneath.

Potential mitigation measures could include increased storm water treatment in areas where facilities can be built, to capture a wider range of pollutants at a greater level of effectiveness and to better reduce overall highway runoff volumes. Potential approaches include:

- Use of multiple BMPs in a treatment train;
- Use of BMPs that are more expensive from either a capital cost or long-term maintenance cost perspective, including BMPs typically incorporated into low-impact development, e.g., pervious pavement; and/or
- Inclusion of BMPs to treat existing impervious surface areas that would otherwise not be treated under the alternative.

No additional mitigation measures for construction impacts should be required. Adherence to ODOT's construction storm water permit requirements imply that the use of BMPs for erosion and sediment and pollutant source controls would reduce construction water quality impacts below a level of significance.

3.10.5 Avoidance, Minimization, and/or Mitigation Commitments Incorporated into the Preferred Alternative

ODOT makes the following commitments.

JTA Phase

- ODOT has developed a Stormwater Management Plan for the JTA phase that details how ODOT will implement water quality and flow control BMPs (ie: bioretention ponds and water quality planters).
- ODOT will treat 22.4 acres of non-ODOT runoff that is within the project vicinity to mitigate for the 3.6 acres of contributing impervious area that is not being treated.

JTA Phase and Preferred Alternative Subsequent to Construction of the JTA Phase

There are no specific mitigation commitments that will apply to both the JTA phase and the Preferred Alternative subsequent to the construction of the JTA phase.

Preferred Alternative Subsequent to Construction of the JTA Phase

ODOT will develop Stormwater Management Plans for any construction phases subsequent to the JTA phase.

Section 3.11 Content

- 3.11.1 Affected Environment
 - 3.11.1.1 Conservation Opportunity Areas
 - 3.11.1.2 Wildlife Migration
- 3.11.2 Environmental Consequences
 - 3.11.2.1 Direct Impacts
 - 3.11.2.2 Indirect Impacts
 - 3.11.2.3 Construction Impacts
- 3.11.3 Avoidance, Minimization, and/or Mitigation Measures
- 3.11.4 Avoidance, Minimization, and/or Mitigation Commitments Incorporated Into the Preferred Alternative

3.11 Natural Systems and Communities

This subsection provides an overview of the natural systems in the project area. ODFW has developed a statewide Conservation Strategy that provides a non-regulatory, statewide approach to species and habitat conservation. The strategy synthesizes existing plans, scientific data, and local knowledge into a broad vision and conceptual framework for long-term conservation of Oregon's native fish, wildlife and habitats, but is not a management plan. This subsection highlights natural communities of concern such as Strategy Habitats and Conservation Opportunity Areas as described in the Oregon Conservation Strategy (ODFW 2006). Information about individual plant and animal species is not included in this subsection.

The Conservation Strategy identified barriers to fish and wildlife movement as a top conservation priority. ODFW has mapped wildlife linkages along the state highway system, which are areas of habitat used by wildlife for seasonal or daily movement or migration; they connect core habitats that support necessary life history functions. ODOT has also mapped wildlife collision hot spots, which are locations with high concentrations of deer and elk road kill or carcass reports.

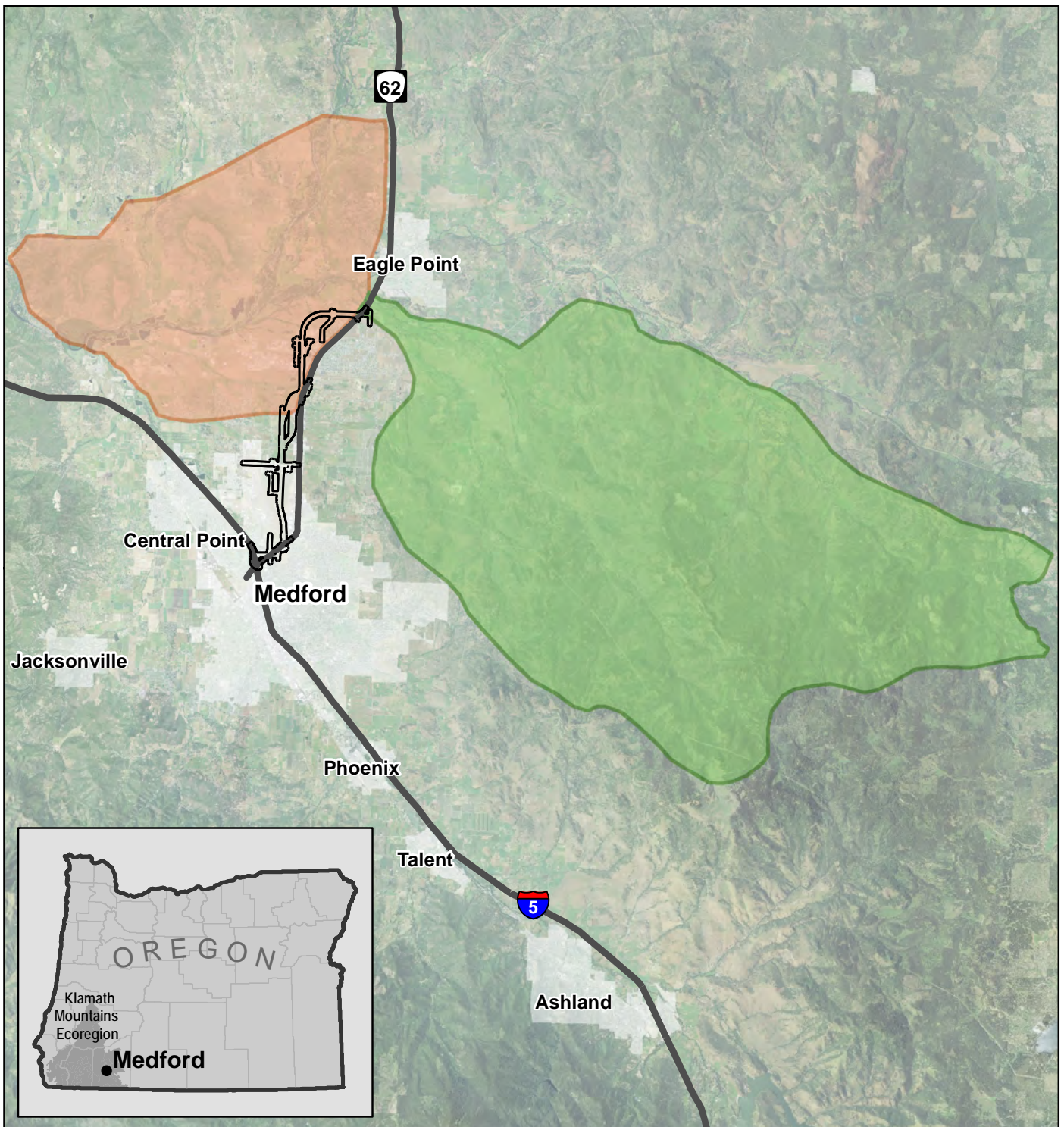
In addition to a description of natural communities in the project area, this subsection includes information on fish passage, wildlife linkages, wildlife collision hot spots, and habitat loss and fragmentation as indicators of change conditions for natural systems and communities.

This section provides information on terrestrial and aquatic communities on a broad, ecosystem scale, and does not provide refined location-specific information. Information in this section is specific to the Oregon Conservation Strategy, which was created to act as a large-scale guidance document for the state. Consequently, the plan uses information that is more generalized rather than site specific. Because of this, there are differences between the habitat types and acreages discussed in this section and Sections 3.12, 3.13, and 3.14. These differences are noted where they occur. For detailed site-specific information on habitats and specific species in the project area, refer to Sections 3.12 through 3.14.

3.11.1 Affected Environment

The API for natural systems and communities is in the eastern side of the Klamath Mountains ecoregion, which covers a portion of southwest Oregon and northwest California, including the Umpqua Mountains, Siskiyou Mountains, and the foothills and valleys connecting these mountains to the Cascade Range to the east. Figure 3.11-1 shows the API for this resource, which includes the project footprint and a 250-foot buffer on all sides. The area encompassed by this ecoregion is recognized for its plant diversity and global biological significance (ODFW 2006). Land use changes, water quality and quantity, and invasive species are considered the biggest conservation issues within the Klamath Mountains ecoregion.

Figure 3.11-1



Map Features



Area of Potential Impact

Conservation Opportunity Areas (COA)



Antelope Creek COA



North Medford COA



0 2 4
Miles

Natural Systems and Communities

September 2012

Source: Jackson County GIS, Oregon DFW,
URS Corp.



3.11.1.1 Conservation Opportunity Areas

There are two Conservation Opportunity Areas (COAs) that lie partially within the API, the North Medford COA and Antelope Creek COA, as depicted on Figure 3.11-1. COAs are priority areas where fish and wildlife conservation goals have been established because they have the greatest potential to be met. Focusing conservation efforts in these areas is expected to increase the potential for long-term success over large landscapes and be an efficient use of conservation efforts.

Conservation Opportunity Areas are landscapes where broad fish and wildlife conservation goals would be best met and were developed to guide voluntary actions.

Strategy Habitats are native vegetation assemblages identified by the Oregon Department of Fish and Wildlife as needing conservation and restoration.

North Medford Conservation Opportunity Area

The North Medford COA encompasses 31,451 acres, 533 (1.7 percent) of which are within the API. This COA includes several important areas recognized for their ecological value, including the Denman Wildlife Area, Upper and Lower Table Rocks, Agate Desert Preserve, and the Whetstone Savannah Preserve and provides important low elevation habitats. The North Medford COA contains many endemic, rare plants and is considered an important site for migrating and nesting waterfowl. Strategy habitats within the North Medford COA include freshwater aquatic, grasslands, oak savannah, riparian, and wetlands as depicted in Figure 3.11-2. Table 3.11-1 summarizes the acreage of each strategy habitat within the North Medford COA. The ODFW Conservation Management Strategy does not include any recommended conservation actions for the North Medford COA.

Antelope Creek Conservation Opportunity Area

The Antelope Creek COA encompasses 83,221 acres, with 36 acres (0.04 percent) within the northeastern tip of the API. The Antelope Creek COA encompasses the low elevation foothills east of Medford and provides a diversity of habitats for terrestrial and aquatic species. Antelope Creek COA is comprised of freshwater aquatic, grassland, oak savannah, pine-oak woodland, riparian, and wetland strategy habitats. However as shown in Figure 3.11-2 there is no wetland habitat within the small portion of the Antelope Creek COA inside the northeast end of the API. Table 3.11-1 summarizes the acreage of each strategy habitat within the Antelope Creek COA. Conservation actions recommended for the Antelope Creek COA include: invasive species management; maintenance and enhancement of in-channel watershed function; maintenance and restoration of riparian function; and protection, maintenance, and enhancement of pine-oak woodland, grassland, and oak savannah strategy habitats.

Table 3.11-1 Strategy Habitat Acreage by Conservation Opportunity Area¹

Strategy Habitat	Conservation Opportunity Area			
	North Medford		Antelope Creek	
	Within Entire COA	Within API	Within Entire COA	Within API
Freshwater Aquatic²	1,055.8	6.6	522.3	1.0
Grassland and Oak Savannah	2,701.7	51.8	9,700.8	5.8
Riparian	529.3	0.2	180.7	0.2
Wetland	647.2	2.9	181.8	0.0
Pine-oak Woodland	1,148.2	1.6	11,573.0	0.2

Notes:

¹Habitat types described in the table only reflect habitats identified in the Oregon Conservation Strategy that are within the Conservation Opportunity Areas crossed by the API. Therefore habitat types differ from those discussed in Sections 3.12, 3.13, and 3.14.

²Aquatic habitat represents all water bodies within the COA and API

Source: ODFW 2005a; ODFW 2005b

A **wildlife linkage** is an area needed by animals to move from one location to another for needs such as food, shelter, or access to mates.

A **wildlife collision hot spot** is an area along a highway that has a known or potential vehicle safety concern due to frequent or regular animal-vehicle collisions.

3.11.1.2 Wildlife Migration

A large portion of the project footprint runs through wildlife linkage areas for elk and the northwestern pond turtle, depicted in Figure 3.11-3. All wildlife linkage areas within the API are of medium value, which means the areas provide valuable connectivity to species, but doesn't provide the only way for animals to obtain food, shelter, and access to mates. All wildlife linkage areas are highly susceptible to threats, meaning that a threat to the wildlife linkage could degrade the connectivity function of the linkage (ODFW 2008).

According to ODOT records, the majority of the API is considered to have a low density of automobile-wildlife collisions. A small area in the northern portion of the API has a medium-low density of automobile-wildlife collisions, as Figure 3.11-3 shows (ODOT 2009). Fish passage barriers affecting historic fish migratory streams exist in all of the streams crossed by the project footprint.

3.11.2 Environmental Consequences

3.11.2.1 Direct Impacts

This impact analysis focuses on impacts on the COAs within the API. Direct impacts on natural systems and communities could occur from habitat loss or fragmentation. This could result from constructing a highway facility within strategy habitats, creating a new potential wildlife movement barrier and increasing ADT in areas susceptible to wildlife collisions.

No Build Alternative

There would be no additional impacts on strategy habitats or the species they support under the No Build Alternative. However, new and replacement fish passable structures would not be built under the No Build Alternative.

Build Alternatives

Impacts on natural systems and communities would be the same for both build alternatives and are discussed together in the sections below.

Figure 3.11-2

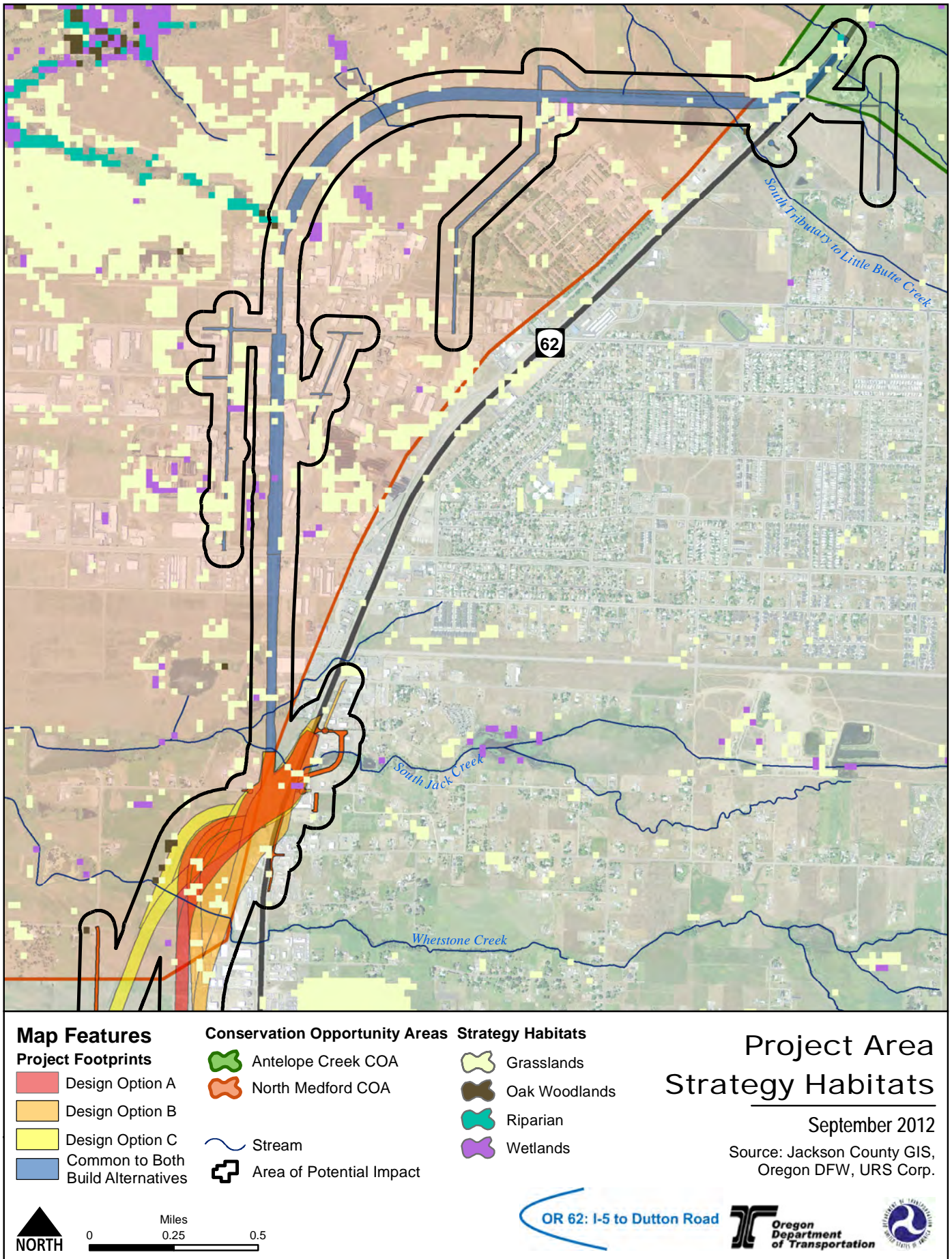


Figure 3.11-2 FEIS

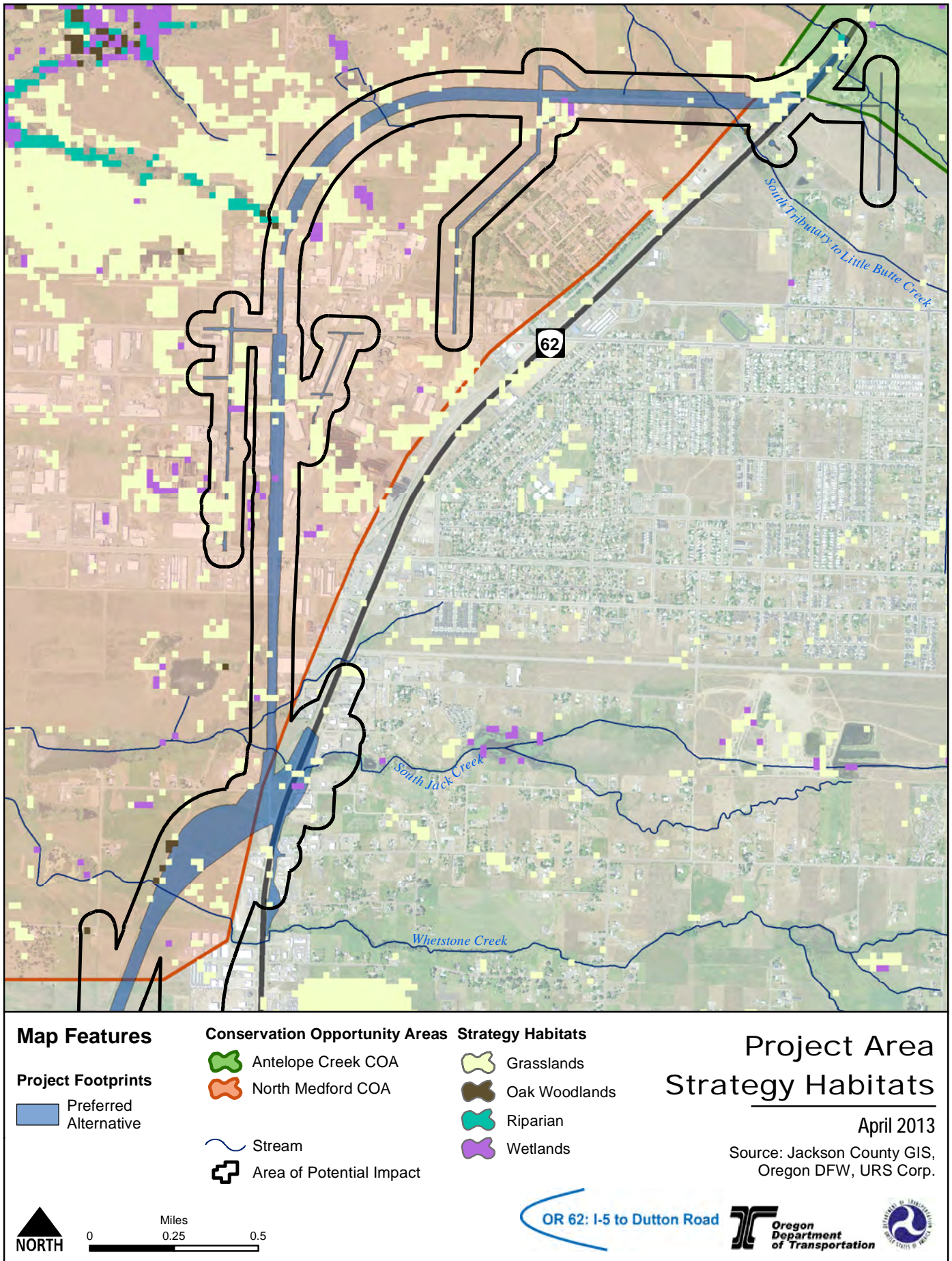


Figure 3.11-3

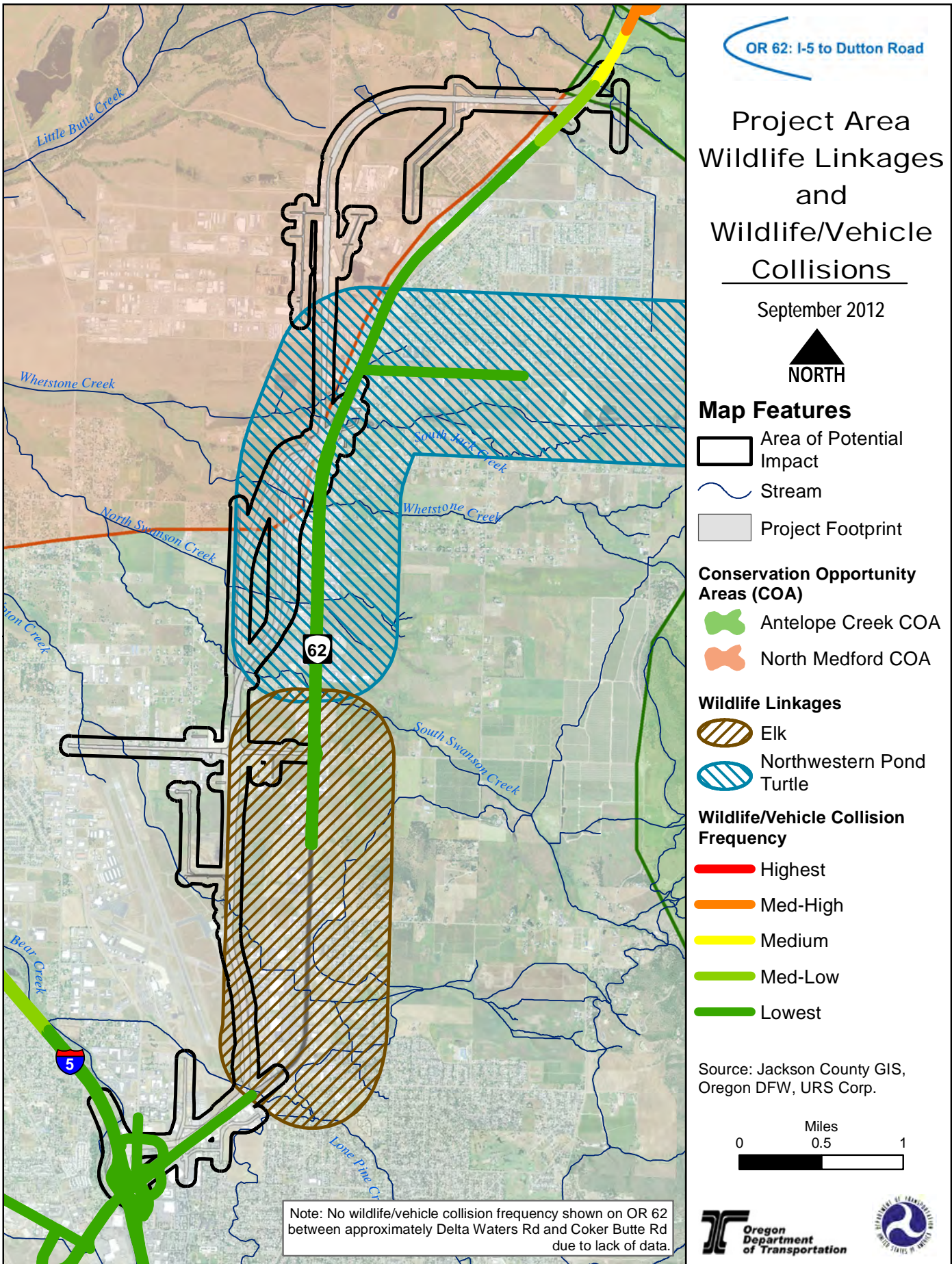
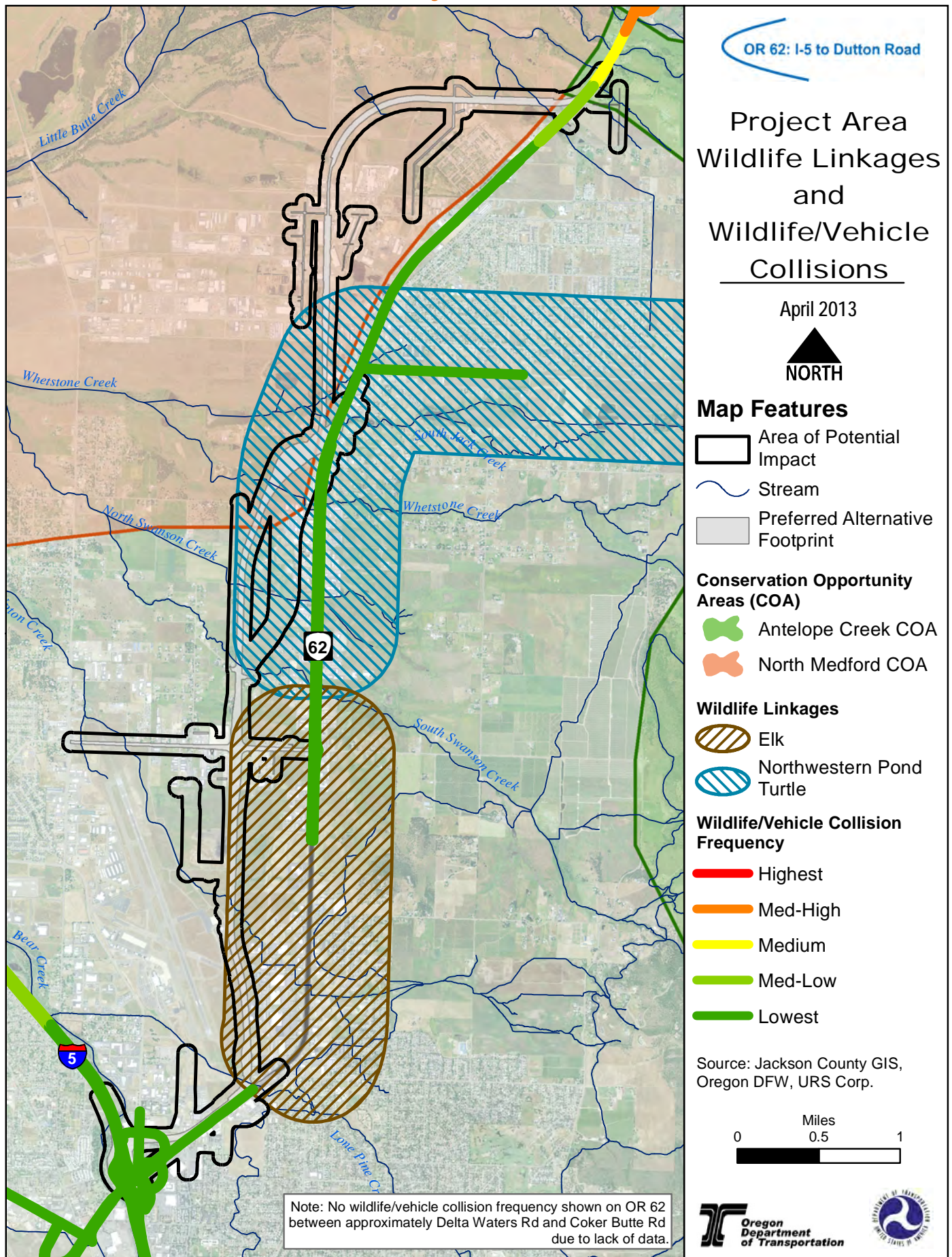


Figure 3.11-3 FEIS



Strategy Habitat Loss

Strategy habitat loss is measured by acres of strategy habitat that is present within the project footprint. The habitat acreage within the project footprint would be considered lost because it would be converted to roadway or right-of-way and no longer function as strategy habitat. Table 3.11-2 summarizes these habitat impacts by alternative and design option. Figure 3.11-2 shows the strategy habitats within the project footprint that would be converted to roadway use.

North Medford Conservation Opportunity Area

The SD and DI Alternatives would cause minor impacts on strategy habitats within the North Medford COA from habitat loss and fragmentation. The SD and DI Alternatives would convert the same amount of strategy wetland and grassland habitat, as indicated in Table 3.11-2. Approximately 0.03 percent of the total wetlands within the North Medford COA would be converted to roadway use. All three design options would displace or span the same amount of wetlands. A maximum of 0.4 percent of the total grasslands within the North Medford COA would be converted to roadway facility. Design Option B would convert the most grasslands: 2.0 acres more than Design Option A and 2.5 acres more than Design Option C. These conversions would occur in areas near the urban interface. On their own, the conversion of wetlands and grasslands would not likely cause noticeable impacts on the overall North Medford COA ecosystem. The build alternatives would fragment the wetland and grassland strategy habitats, potentially causing species in the area to move to more suitable habitat further from the project area. However due to the proximity of grassland habitat to urban areas and the high number of invasive species within the grasslands, it is possible that some species already have moved to more suitable habitat farther from urban areas. Regardless, any habitat loss within a COA would be inconsistent with the ODFW strategy for conservation. Impacts on the North Medford COA would be minor because they would be confined to a small area near the urban interface.

Antelope Creek Conservation Opportunity Area

The SD and DI Alternatives would cause negligible impacts on strategy habitats within the Antelope Creek COA from habitat loss and fragmentation. Grassland is the only strategy habitat type that would be converted to roadway use within the Antelope Creek COA. Both build alternatives would convert approximately 0.01 percent of the total grasslands within the Antelope Creek COA. All three design options would impact the same amount of grassland habitat. This amount of conversion is small and impacts on the Antelope Creek COA ecosystem would be considered negligible. The build alternatives would fragment the grassland habitat, potentially causing species in the area to move to more suitable habitat. A recommended conservation action for the Antelope Creek COA is to protect, maintain, and enhance grasslands. The build alternatives would be inconsistent with this conservation action. Impacts on the Antelope Creek COA would be negligible because they would be confined to such a small area.

Wildlife Migration

Impacts on wildlife migration may occur from new or additional development within wildlife linkages and increasing Average Daily Traffic (ADT) in automobile-wildlife collision hotspots. Both build alternatives would construct new and reconstruct existing roadway facilities within wildlife linkage areas for northwestern pond turtle and elk, as shown in Figure 3.11-3

These new and/or reconstructed facilities could make it more difficult for these species to obtain food, shelter, and access mates. Both build alternatives would also increase ADT in the project area as compared to the No Build Alternative. An increase in ADT could also increase the number of automobile-wildlife collisions in the area. All stream crossings would be designed to be fish passable. Some existing fish barriers would be removed, improving the potential for fish migration in or through the API.

JTA Phase

Strategy Habitat Loss

North Medford Conservation Opportunity Area

The JTA phase would convert a small amount of oak woodland and grassland habitat to roadway or right-of-way as shown in Table 3.11-2. Wetlands and riparian strategy habitats identified by ODFW in the Oregon Conservation Strategy would not be affected. It should be noted that wetland and riparian strategy habitats identified by ODFW differ from those identified through a more site-specific analysis, reported in Sections 3.12, 3.13, and 3.14. JTA phase Design Option C would convert 0.4 acres of oak woodland habitat, as shown in Table 3.11-2. This represents 0.03 percent of the total oak woodland habitat within the entire North Medford COA. JTA phase Design Option B would impact the most grassland habitat: 1.3 acres more than JTA phase Design Option C and 1.8 acres more than JTA phase Design Option A. JTA phase Design Option B would impact 0.07 percent of the total grassland habitat within the North Medford COA. Due to the small acreage of habitat conversion compared to the entire North Medford COA, impacts would be negligible. The JTA phase would fragment the oak woodland and grassland strategy habitats, potentially causing species in the area to move to more suitable habitat farther from the project area. Additionally, none of the JTA phase design options would be consistent with the Oregon Conservation Strategy because the JTA phase would convert strategy habitat in a COA to roadway or right-of-way. The JTA phase impacts on the North Medford COA would be minor because they would occur in a small area near the urban interface. Table 3.11-2 summarizes which strategy habitats would be converted from JTA phase design options, and Figure 3.11-2 shows the location of strategy habitats relative to the JTA phase.

Antelope Creek Conservation Opportunity Area

None of the JTA phase design options would convert strategy habitats within the Antelope Creek COA.

Wildlife Migration

The JTA phase would have the same types of impacts on wildlife migration as discussed above for the build alternatives.

3.11.2.2 Indirect Impacts

Indirect impacts on natural systems and communities could occur from development resulting from the project.

No Build Alternative

As described in Section 3.2, build-out of the land within existing UGBs of Medford and Eagle Point and the White City UUCB would likely occur under the No Build Alternative, but plan amendments and zone changes to allow larger-scale development would be constrained. This development, although constrained, could cause additional conversion of plant and wildlife habitat.

Table 3.11-2 Summary of Strategy Habitat Loss in Acres

Strategy Habitat	Build Alternatives			JTA Phase		
	Design Option A	Design Option B	Design Option C	Design Option A	Design Option B	Design Option C
North Medford Conservation Opportunity Area						
Wetland	0.2	0.2	0.2	0.0	0.0	0.0
Oak Woodland	0.0	0.0	0.4	0	0	0.4
Grassland	10.7	12.7	10.2	0.2	2.0	0.7
Riparian	0.0	0.0	0.0	0.0	0.0	0.0
Antelope Creek Conservation Opportunity Area						
Wetland	0.0	0.0	0.0	0.0	0.0	0.0
Oak Woodlands	0.0	0.0	0.0	0.0	0.0	0.0
Grassland	1.3	1.3	1.3	0.0	0.0	0.0
Riparian	0.0	0.0	0.0	0.0	0.0	0.0

Source: ODFW 2005a; ODFW 2005b

Build Alternatives and JTA Phase

As described in Section 3.2, Land Use, the build alternatives and JTA phase could accelerate land development allowed by the Medford, Eagle Point, and Jackson County comprehensive plans, including within the White City UUCB, and reduce constraints on plan amendments and zone changes to allow larger-scale development within the Medford and Eagle Point UGBs. Such larger-scale development would not necessarily result in more strategy habitat conversion than the No Build Alternative, and could result in less.

3.11.2.3 Construction Impacts

No Build Alternative

There would be no construction with the No Build Alternative, so there would be no construction-related impacts on natural systems and communities.

Build Alternatives and JTA Phase

Project construction is expected to stay within the project footprint, so construction impacts on COAs, strategy habitats, and species that use those habitats are expected to be similar to the direct and indirect impacts described above. Storm water runoff from disturbed areas during construction could cause some impacts if storm water were to reach wetlands. Measures would be taken as part of construction storm water permit compliance to protect wetlands from receiving storm water runoff during construction.

3.11.3 Avoidance, Minimization, and/or Mitigation Measures

Impacts on natural systems and communities would be avoided, minimized, and mitigated through the measures described in Sections 3.12, 3.13, 3.14, and 3.15 for wetlands, species protected under the state and federal ESA and non-ESA species, and invasive species. Additionally some of the project's culverts could provide safe crossing opportunities for small mammals and aquatic species.

3.11.4 Avoidance, Minimization, and/or Mitigation Commitments Incorporated into the Preferred Alternative

Impacts on natural systems and communities will be avoided, minimized, and mitigated through the commitments described in Sections 3.12, 3.13, 3.14, and 3.15. In addition to these, ODOT makes the following commitments.

JTA Phase

There are no mitigation commitments exclusive to the JTA phase.

JTA Phase and Preferred Alternative Subsequent to Construction of the JTA Phase

All new and replacement culverts will be dual box culverts. These dual box culverts will be designed to be either 2.2 or 1.5 times the active channel width and will have both a low flow channel for normal flows and a high flow channel to accommodate high-water events. The high flow channel will be dry most of the time, allowing animals up to the size of a deer to cross under the bypass.

Preferred Alternative Subsequent to Construction of the JTA Phase

There are no mitigation commitments exclusive to the Preferred Alternative.

Section 3.12 Content

- 3.12.1 Regulatory Setting
- 3.12.2 Affected Environment
 - 3.12.2.1 Wetlands
 - 3.12.2.2 Waterways
- 3.12.3 Environmental Consequences
 - 3.12.3.1 Direct Impacts
 - 3.12.3.2 Indirect Impacts
 - 3.12.3.3 Construction Impacts
 - 3.12.3.4 Agency Coordination
 - 3.12.3.5 Required Permits
 - 3.12.3.6 Only Practicable Alternative Finding
- 3.12.4 Avoidance, Minimization, and/or Mitigation Measures
 - 3.12.4.1 Direct Impacts
 - 3.12.4.2 Indirect Impacts
 - 3.12.4.3 Construction Impacts
- 3.12.5 Avoidance, Minimization, and/or Mitigation Commitments Incorporated Into the Preferred Alternative
 - 3.12.5.1 Project Design
 - 3.12.5.2 Project Construction

3.12 Wetlands and Other Waters

3.12.1 Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. The Clean Water Act (CWA) is the primary federal law regulating wetlands and waters. The CWA regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce.

Section 404 of the CWA is administered by the US Army Corps of Engineers (Corps) with oversight by the EPA. The Corps has the authority under Section 404 of the CWA to deny a request to discharge dredged or fill material if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. Section 401 of the CWA authorizes the EPA to review federal actions for potential water quality impacts. Federal actions must receive 401 water quality certification to assure that the proposed action would not violate applicable water quality regulations. In Oregon, EPA has delegated this authority to the DEQ, which issues 401 water quality certifications.

In addition to the CWA, pursuant to Executive Order 11990 and DOT Order 5660.1A, as implemented by the FHWA administrative rule at 23 CFR 777, FHWA will not undertake or provide assistance for new construction located in wetlands unless it finds: 1) that there is no practicable alternative to the construction and, 2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the Department of State Lands (DSL) under the Removal-Fill Law (ORS 196.800-196.990). DSL has jurisdiction up to the Ordinary High Water Line (OHWL) or the edge of the wetland boundary, whichever is higher, on non-tidal streams. DSL has jurisdiction of wetlands up to the wetland/upland boundary.

The City of Medford and Jackson County have local wetland regulations and goals that limit ground disturbance within 50 feet from the top of the stream bank.

The **OHWL** (Ordinary High Water Line) is the line on the bank or shore where the high water ordinarily rises annually in season.

For further information regarding wetlands and other waters, including citations to source documents, refer to the *OR 62 Corridor Solutions Project Wetland Resources Technical Report*, May 2011. This report is available from the ODOT contact person identified on page i of this EIS.

3.12.2 Affected Environment

3.12.2.1 Wetlands

Wetlands are important because they can provide water quality benefits, habitat for fish and wildlife, and support native plant communities. The Hydrogeomorphic (HGM) method for assessing wetlands identifies 13 functions that support these benefits (USACE 2011). Each wetland identified in the API was categorized as high, medium, or low quality based on the 13 functions listed below. Several wetlands in the API were designated as locally significant by the City of Medford Local Wetlands Inventory (LWI) (Wetland Consulting 2002). LWI wetlands were noted, but were assessed using the HGM method for this analysis:

The 13 wetland functions are:

1. Water Storage and Delay
2. Nitrogen Removal
3. Thermoregulation
4. Sediment Stabilization and Phosphorus Retention
5. Primary Production
6. Resident Fish Habitat Support
7. Anadromous Fish Habitat Support
8. Amphibian and Turtle Habitat
9. Breeding Waterbird Support
10. Wintering and Migratory Waterbird Support
11. Songbird Habitat Support
12. Invertebrate Habitat Support
13. Support of Characteristic Vegetation

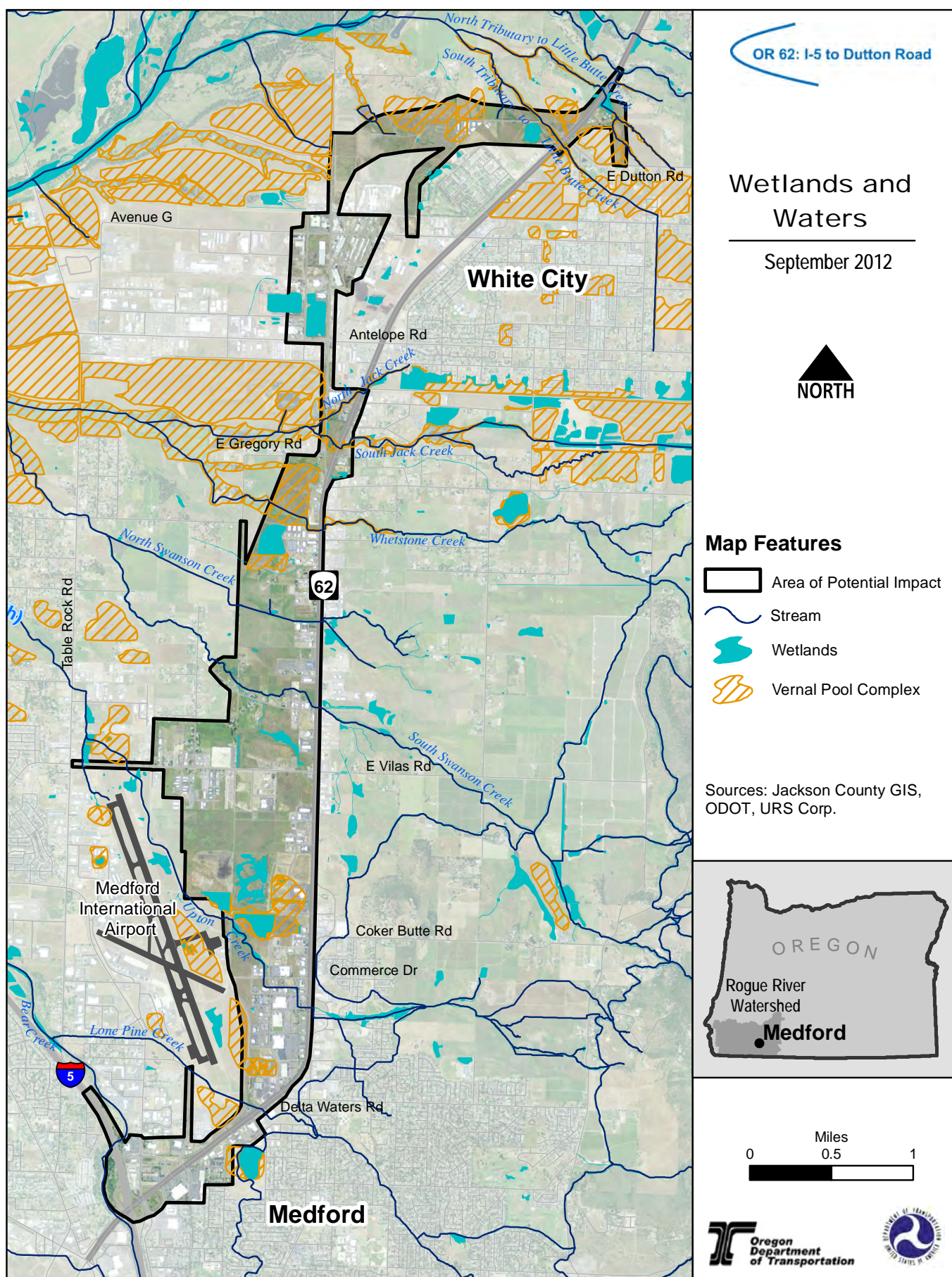
The **HGM Judgmental Method** is an approach used to assess wetlands based on the functions that they perform and their level of performance for those functions (USACE 2011).

Numerous wetlands exist in the API. The API, as shown in Figure 3.12-1, is defined as the project right-of-way, including the proposed bypass and new and/or modified local roads and an additional buffer applied beyond the right-of-way for distances of up to several hundred feet in order to map and describe important wetlands that could be directly or indirectly affected by the project. Most of the wetlands within the API are degraded from past agricultural practices and development for residential, commercial, and industrial purposes. Wetlands were identified using the USFWS National Wetland Inventory (NWI), Jackson County Vernal Pool Maps, City of Medford Local Wetland Inventory (LWI), and data collected from wetland reconnaissance and delineation field work between 1998 and 2010. Locations of the wetlands identified in the API are shown on Figure 3.12-1.

The Corps and DSL have not yet determined which wetlands and waterways within the API are jurisdictional. For this document, all waterways and wetlands within the API are assumed jurisdictional waters of the state and U.S., except for roadside ditches. The Corps and DSL would determine which wetlands in the project footprint are jurisdictional prior to project construction.

DSL has submitted concurrence on jurisdictional determination for the wetlands impacted by the OR 62: I-5 to Dutton Road project. Concurrence from the Corps is still pending.

Figure 3.12-1



Vernal Pool Wetlands

Vernal pool wetlands exist within the API. Vernal pools are created by a shallow, hard soil layer that sits beneath the soil surface and prevents water from seeping into the ground. The pools become inundated by local hydrology during the fall/winter rainy season and dry out during the late spring and summer. This alteration between inundation and drought greatly limits the flora and fauna species that are able to inhabit vernal pool habitat. As a result, most plant and wildlife species inhabiting vernal pools are unique to the area, including vernal pool fairy shrimp (*Branchinecta lynchi*), Cook's Lomatium (*Lomatium cookii*), and large-flowered woolly meadowfoam (*Limnanthes floccosa* ssp. *Grandiflora*) listed as threatened under the Federal ESA. Several small vernal pools are often found together and form a Vernal Pool Complex (VPC). All VPCs are assumed to have the potential to contain vernal pool fairy shrimp and are considered medium or high quality wetlands due to their relative scarcity and potential to support ESA-listed species. Vernal pools were further categorized as low, medium, and high quality vernal pools based on a vernal pool function assessment. Section 3.13 Threatened and Endangered Species provides more detail on low, medium, and high quality vernal pools within the API. The VPCs are present throughout the entire API, but are most densely located near the airport, in the southwest portion of the API. Figure 3.12-1 shows the locations of the vernal pools in the API.

3.12.2.2 Waterways

From south to north, 11 streams flow through the API: Bear Creek, Lone Pine Creek, Upton Creek, north and south branches of Swanson Creek, Whetstone Creek, north and south branches of Jack Creek, and three unnamed tributaries to Little Butte Creek, as shown in Figure 3.12-1. All streams eventually drain west to the Rogue River. With the exception of Bear Creek, most of the streams are relatively small and all are degraded by agriculture or development.

3.12.3 Environmental Consequences

3.12.3.1 Direct Impacts

Direct impacts on wetlands and waters result from the construction of permanent structures (e.g., roadway fill, bridge pier foundations) within a wetland or below the OHWL of "waters of the U.S./State." Direct impacts result in a temporary or permanent loss of wetland area and function. Table 3.12-1 summarizes the direct impacts on low, medium and high quality wetlands by alternative and design option. Impacts on waterways are discussed in Section 3.9 and Section 3.10. Specific impacts on vernal pools are discussed in Section 3.13 because all vernal pools are assumed to potentially support ESA-listed vernal pool fairy shrimp.

Due to the design refinements and some refinement in wetland delineation that have occurred since the publication of the DEIS, there have been changes to the acreage of direct impacts on wetlands. These changes are described in detail below. Table 3.12-1 now includes the updated numbers.

No Build Alternative

There would be no impacts on wetlands under the No Build Alternative.

Build Alternatives

There is a minor difference in the direct wetland impacts between the two build alternatives. The SD Alternative would directly impact 20.3 to 23.3 total acres of wetlands, depending on the design option chosen, which is approximately 0.5 acres more than the DI Alternative. This difference between the SD and DI Alternatives is only for medium quality wetlands. Both build alternatives would directly impact the same amount of low and high quality wetlands. Most impacts would occur to small low quality, non-vernal pool, and linear, vegetated storm water ditches. Both build alternatives would impact the same amount of vernal pool wetlands: 2.6 to 3.2 acres, as shown in Table 3.12-1, depending on the design

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option. These numbers are less than the vernal pool impacts reported in Section 3.13 Threatened and Endangered Species, because direct wetland impacts reported in this section used methods approved by the Corps and DSL, and impacts reported in Section 3.13 used methods approved by USFWS which are more conservative. Both build alternatives would impact several wetlands designated as locally significant by the City of Medford LWI. Wetland impacts associated with the build alternatives are shown in Figures 3.12-2 through 3.12-7. Figure 3.12-3 shows wetland impacts by alternative in the southern portion of the API, where build alternative footprints differ.

The design refinements that have occurred since the publication of the DEIS have resulted in a reduction of impacts to wetlands with the Preferred Alternative. The removal of the new roadways to connect to the USCIS facility from Vilas Road will result in a 0.3 acre reduction in impacts to wetlands classified as high quality and vernal pools. The removal of the extension of Crater Lake Avenue to Gramercy Drive will result in a 0.5 acre reduction in impacts to medium quality wetlands.

Since the publication of the DEIS, new vernal pools have been identified on the Wilson property, located immediately north of Whetstone Creek. This has increased the acreage of impacts to wetlands classified as high quality and vernal pools by approximately 0.5 acres with the Preferred Alternative. This increase combined with the reductions due to the design refinements results in a net 0.3 acre decrease in the total wetlands impacted and a net 0.2 acre increase in the impacts to vernal pools. Table 3.12-1 summarizes the direct impacts on low, medium and high quality wetlands and vernal pools for the Preferred Alternative.

Table 3.12-1 Summary of Impacts on High, Medium, and Low Quality Wetlands and Vernal Pools by Alternative (Acres)¹

Wetland Quality ²	No Build Alternative	SD Alternative			DI Alternative		
		Design Option A	Design Option B	Design Option C (Preferred Alternative)	Design Option A	Design Option B	Design Option C
Low	0	15.6	14.5	16.5	15.6	14.5	16.5
Medium	0	3.6	3.2	4.1 3.6	3.1	2.7	3.6
High	0	2.9	2.6	2.7 2.9	2.9	2.6	2.7
Total ⁴	0	22.1	20.3	23.3 23.0	21.6	19.8	22.8
Vernal Pools ³	0	3.2	2.6	3.2 3.4	3.2	2.6	3.2

Notes:

¹Impact acres shown in the table reflect the number of acres within the project footprint.

²Wetland quality was assessed based on how well each wetland performed the 13 functions described in Section 3.12.2.1.

³Vernal pools are a subset of medium or high quality wetlands.

⁴Numbers may not appear to add up to the shown total due to rounding. The total is a sum of low, medium, and high quality wetlands.

Source: Wetlands Resources Technical Report

The footprint for both build alternatives would be identical north of Commerce Drive. Therefore, impacts on wetlands north of Commerce Drive would be the same for both build alternatives, as illustrated in Figures 3.12-4 through 3.12-7.

Design Options

Impacts from the three design options would be common to both build alternatives. Design Option C would impact more wetlands than Design Option A or Design Option B. This is mostly because of the crossing of a large, low quality wetland terrace along north Swanson Creek. Design Option C would impact approximately 1.2 acres more than Design Option A and 3.0 acres more than Design Option B. Most impacts would occur to low quality wetlands located along Swanson, Whetstone, and Jack Creeks. Design Option A would impact more high quality wetlands than the other design options: approximately 0.2 acres more than Design Option C and 0.3 acres more than Design Option B. Figure 3.12-4 and 3.12-5 show wetland impacts by design option.

Figure 3.12-2

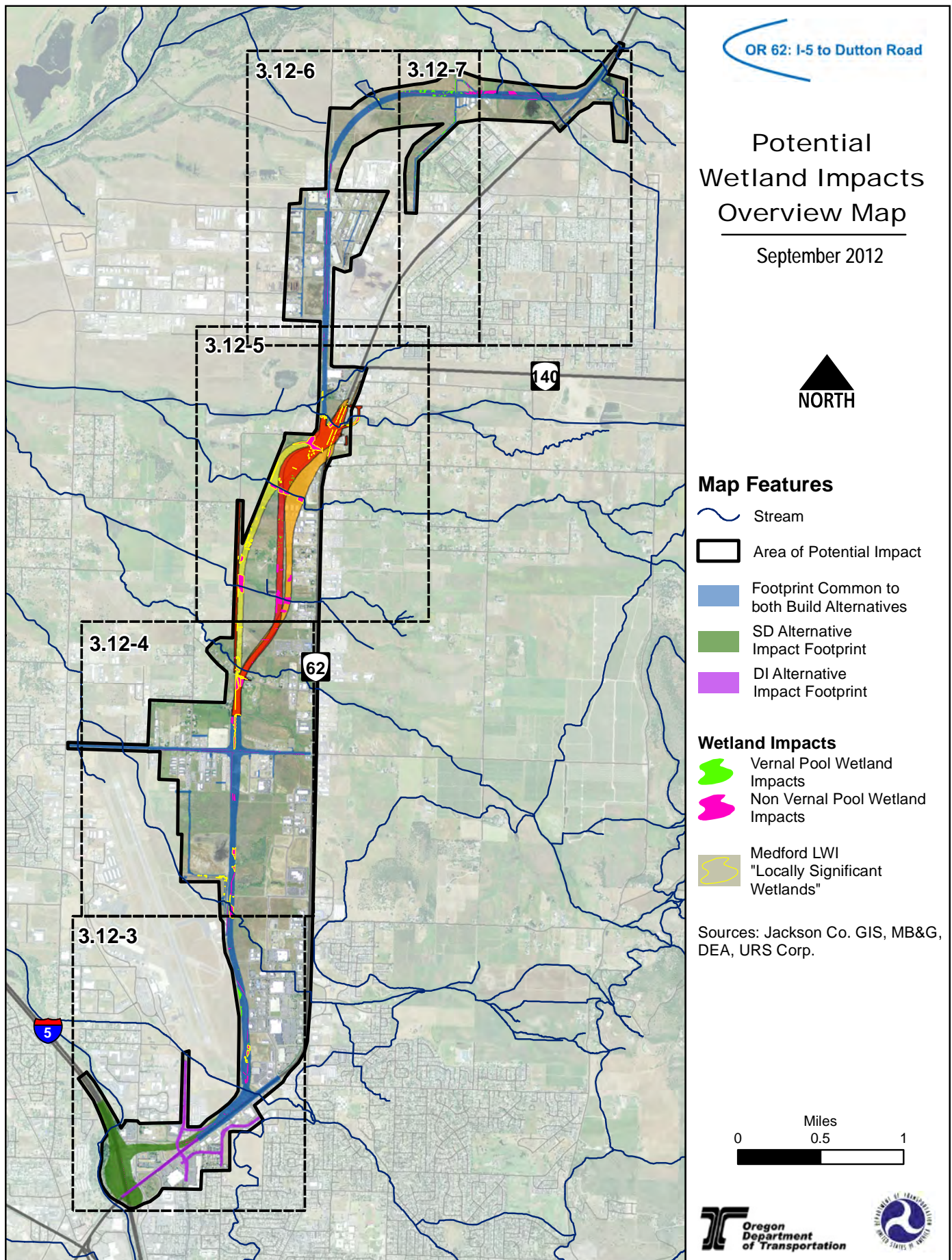


Figure 3.12-2 FEIS

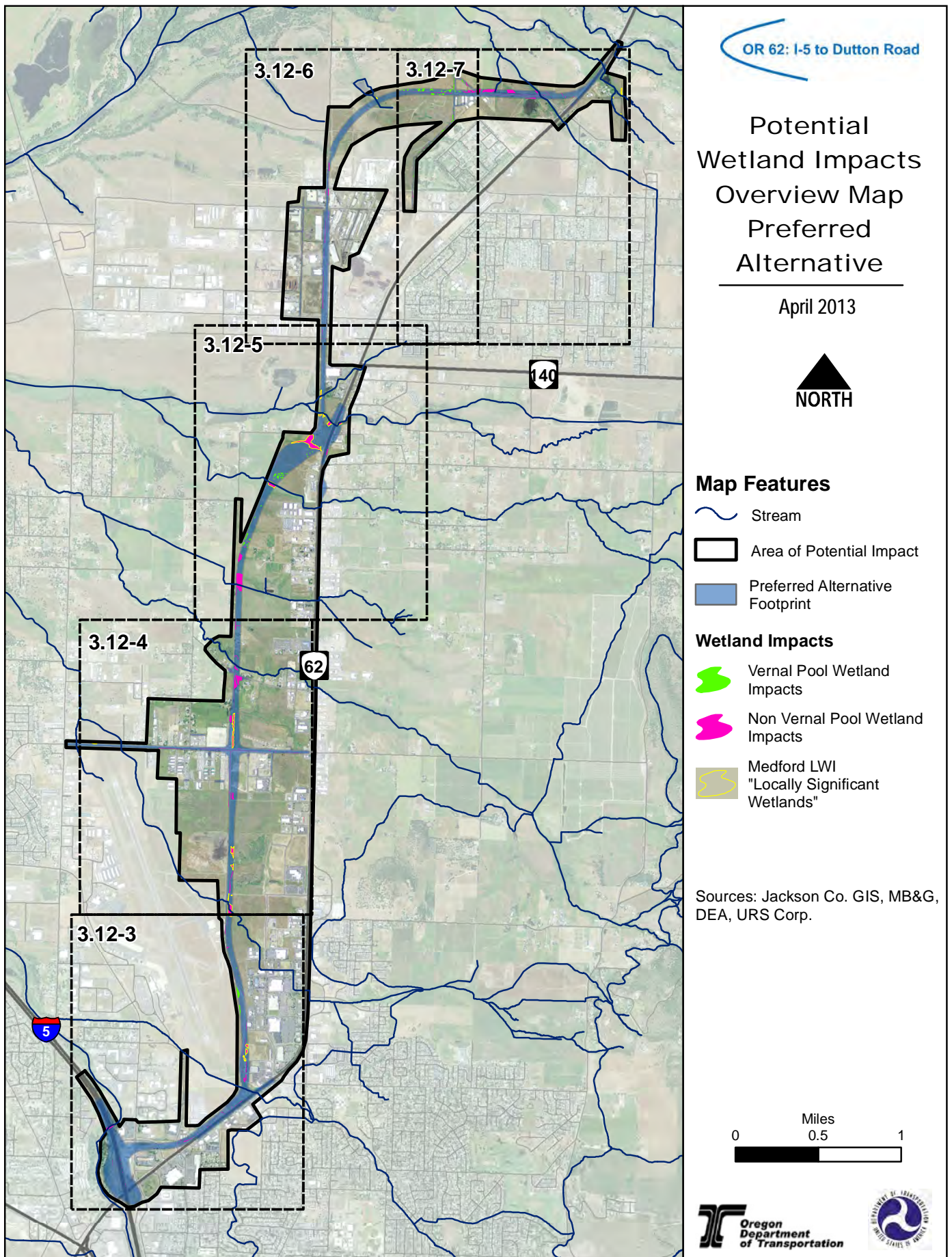


Figure 3.12-3

**Potential Wetland Impacts -
South Terminus**
September 2012

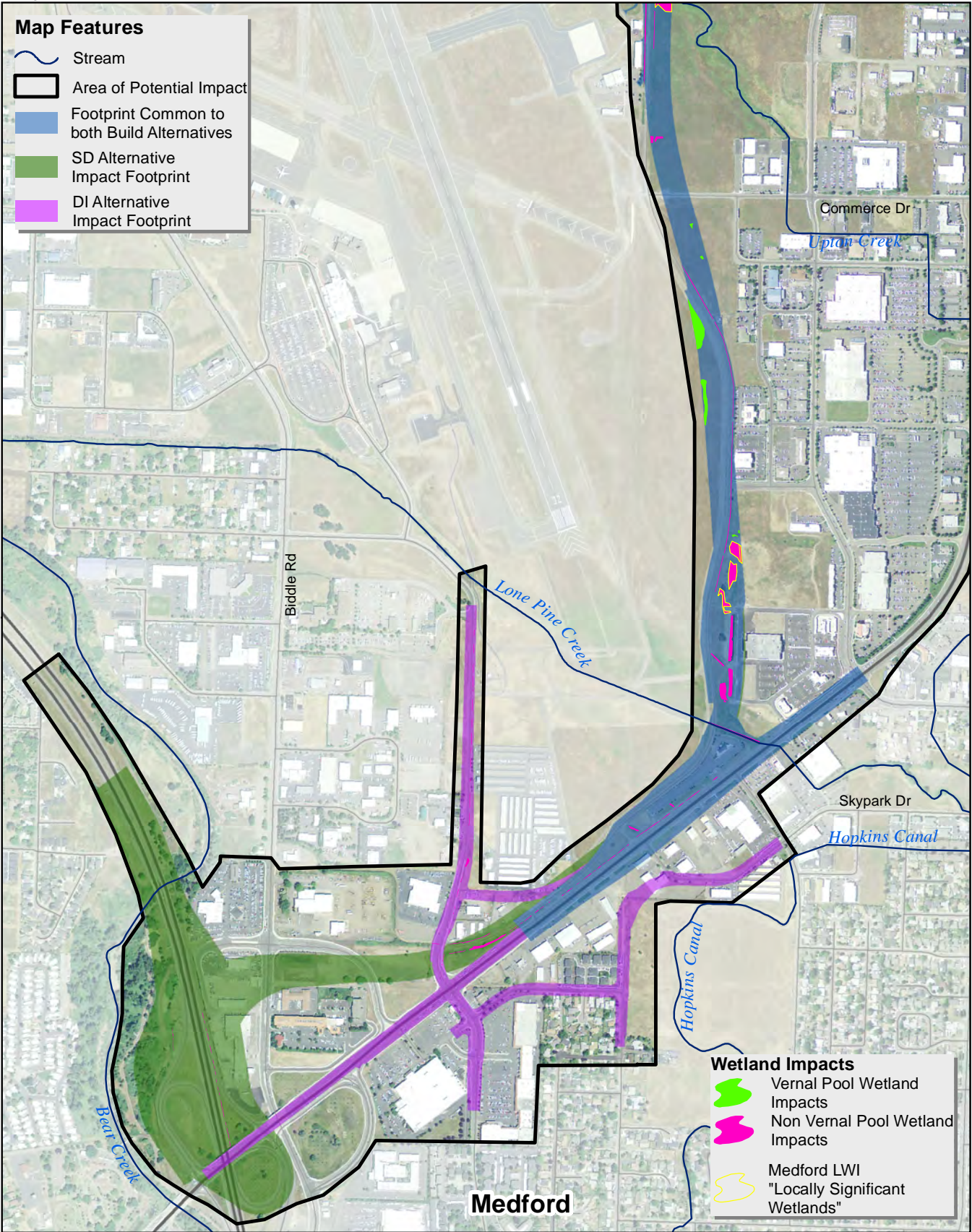
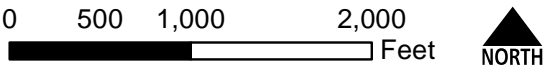


Figure 3.12-3 FEIS

Potential Wetland Impacts - Preferred Alternative South Terminus

April 2013

0 500 1,000 2,000
Feet

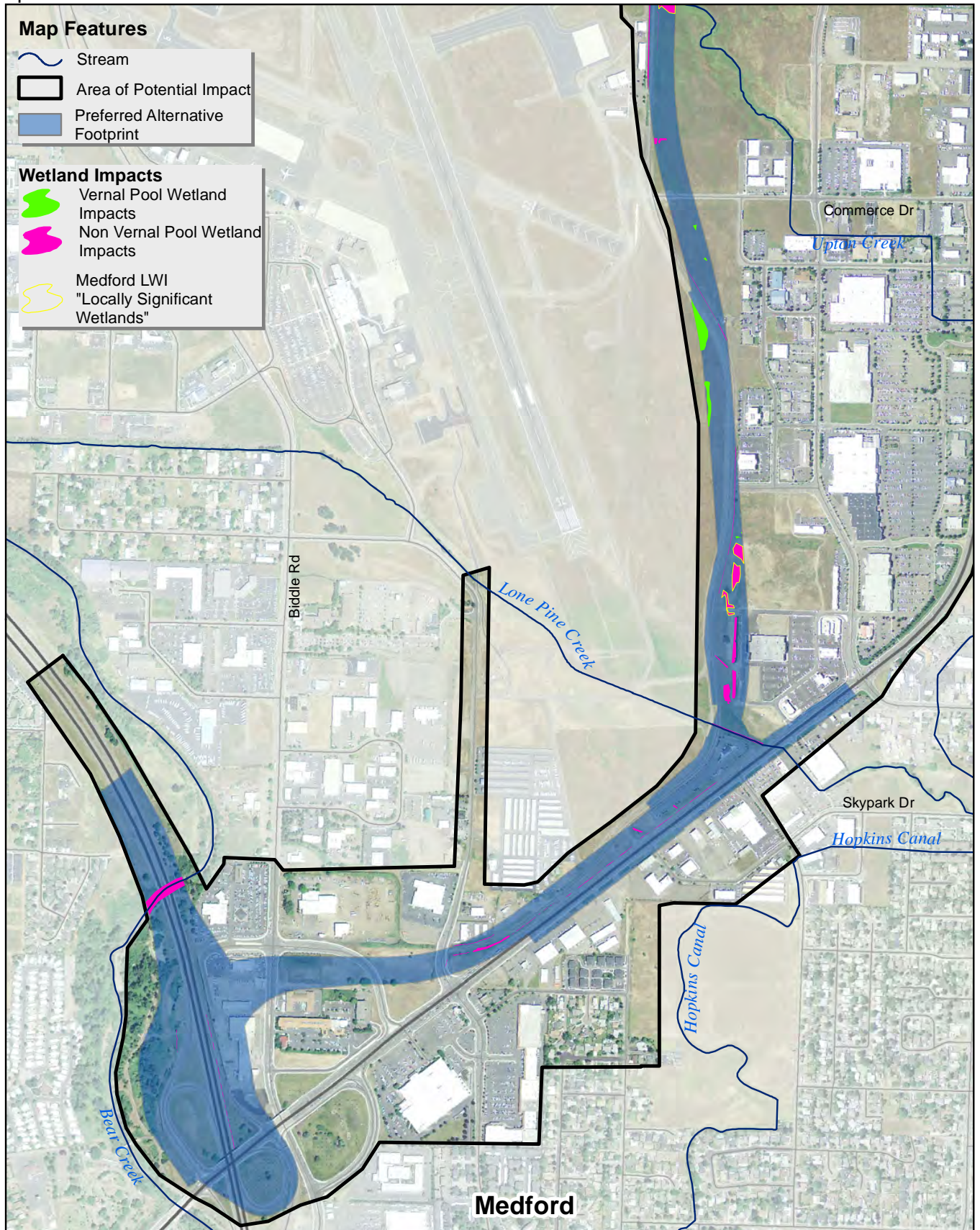


Figure 3.12-4

Potential Wetland Impacts -

Vilas Rd Vicinity

September 2012

0 500 1,000 2,000
Feet

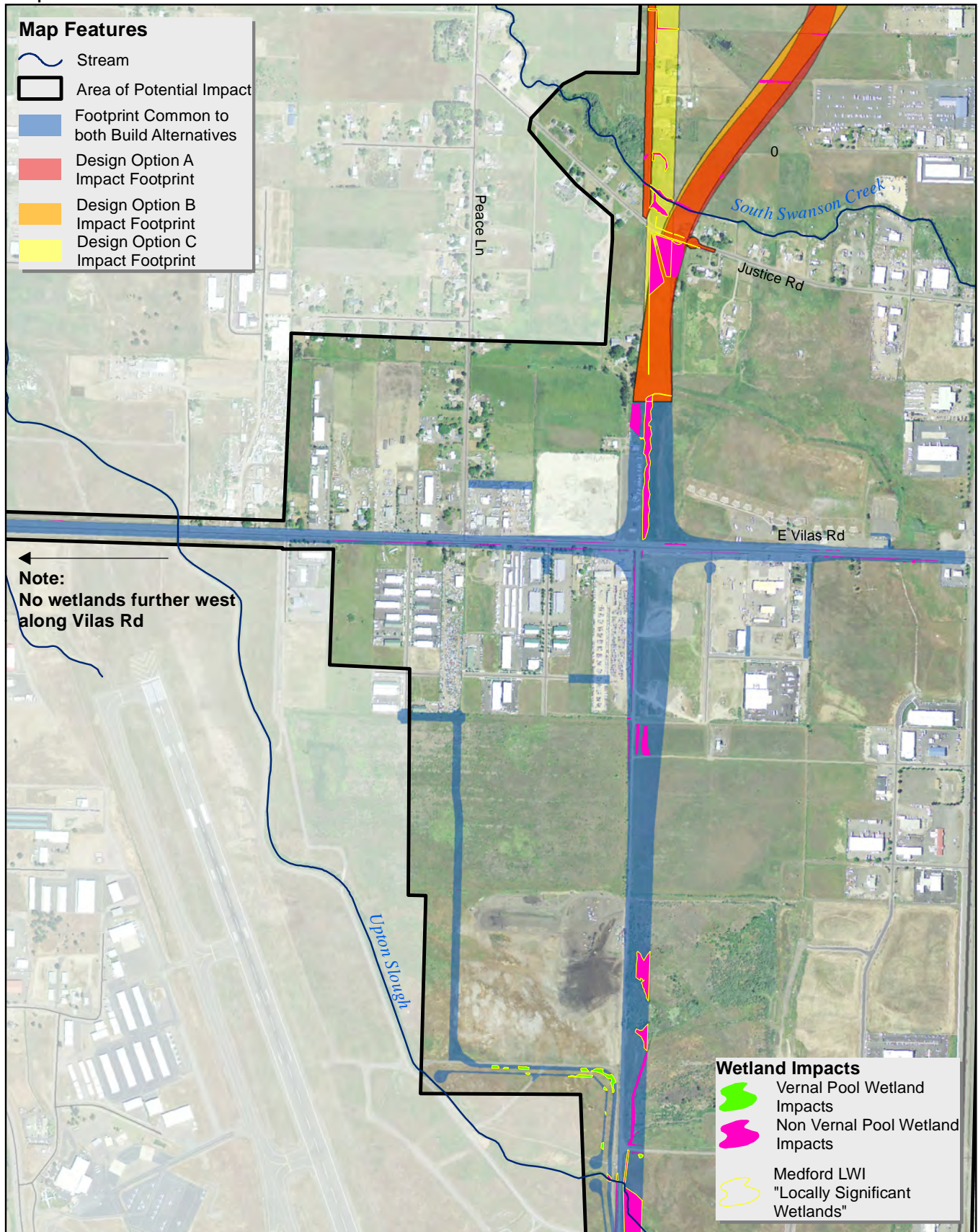


Figure 3.12-4 FEIS

Potential Wetland Impacts - Preferred Alternative Vilas Road Vicinity

April 2013

0 500 1,000 2,000
Feet

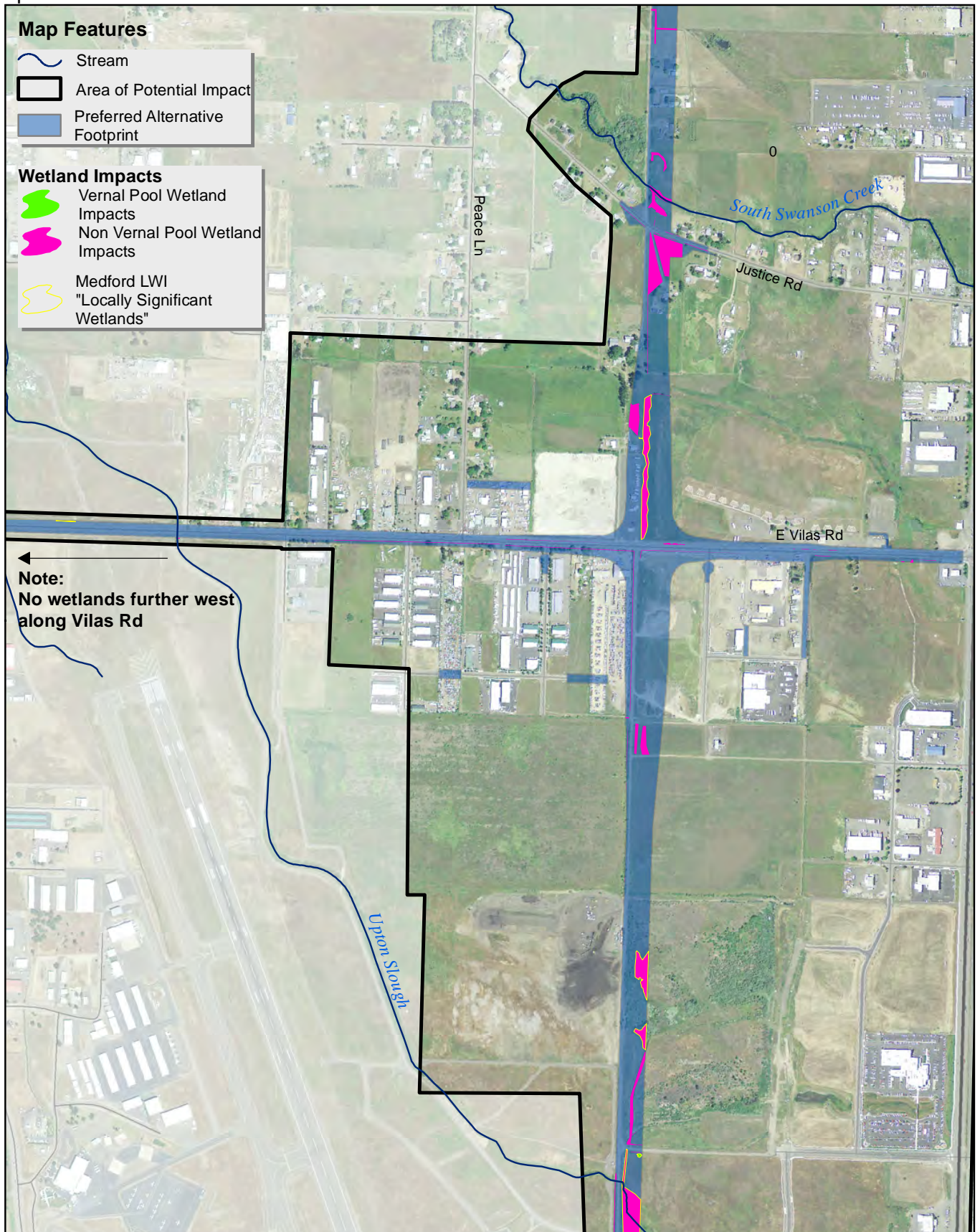


Figure 3.12-5

Potential Wetland Impacts -
By Design Option
 September 2012

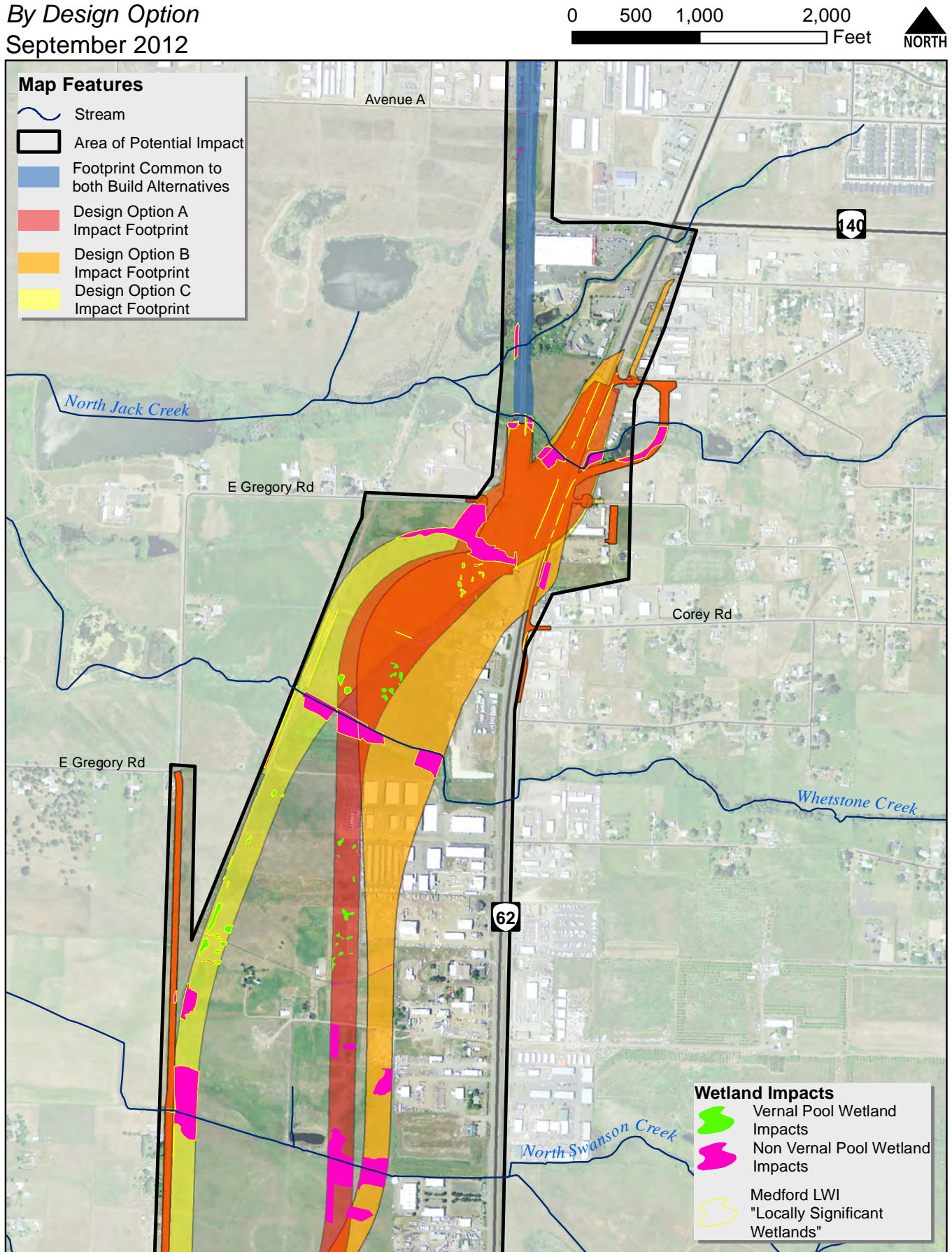


Figure 3.12-5 FEIS

Potential Wetland Impacts - Preferred Alternative Agate Interchange Area

April 2013

0 500 1,000 2,000
Feet

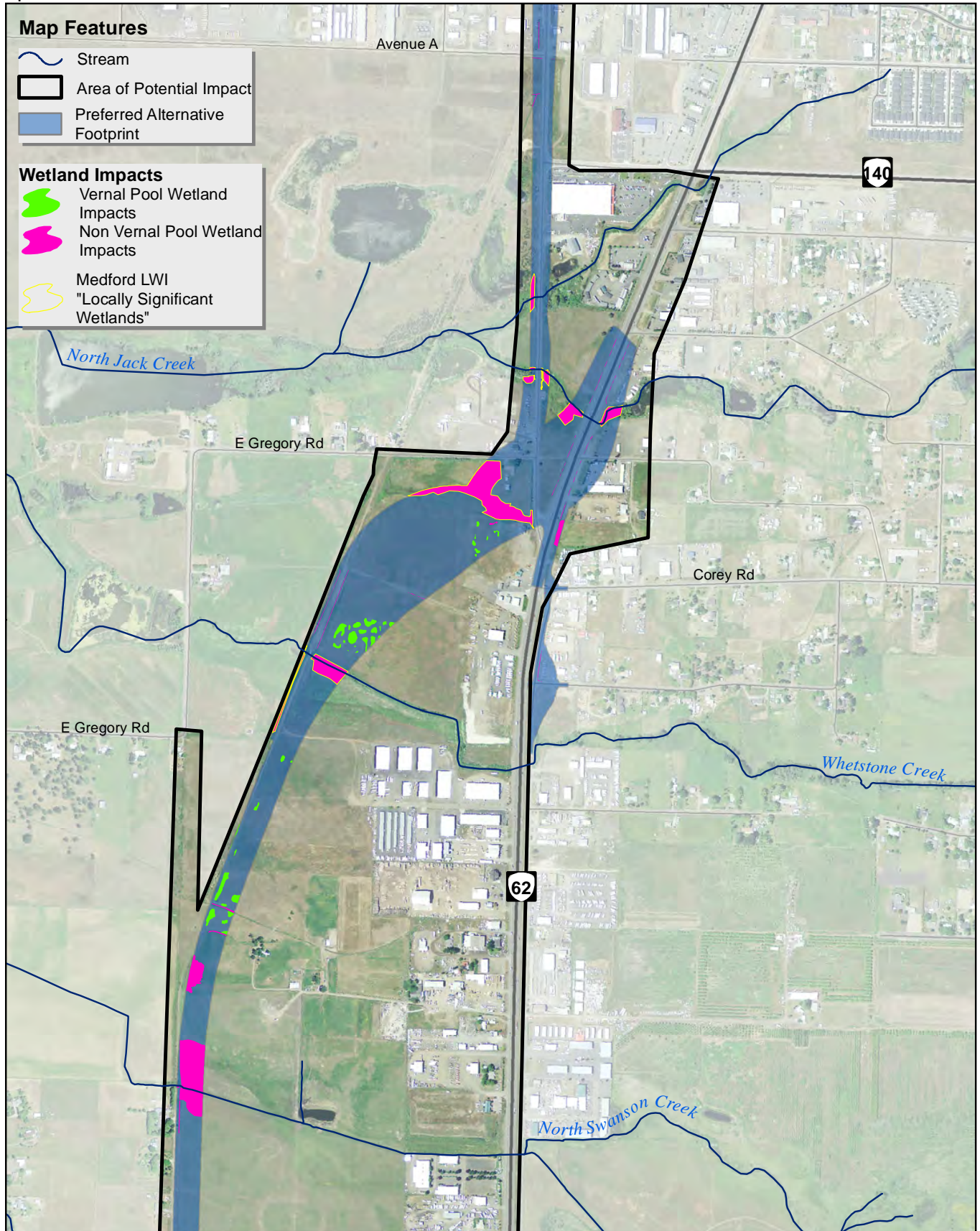


Figure 3.12-6

**Potential Wetland Impacts -
Antelope Rd to W Dutton Rd**
September 2012

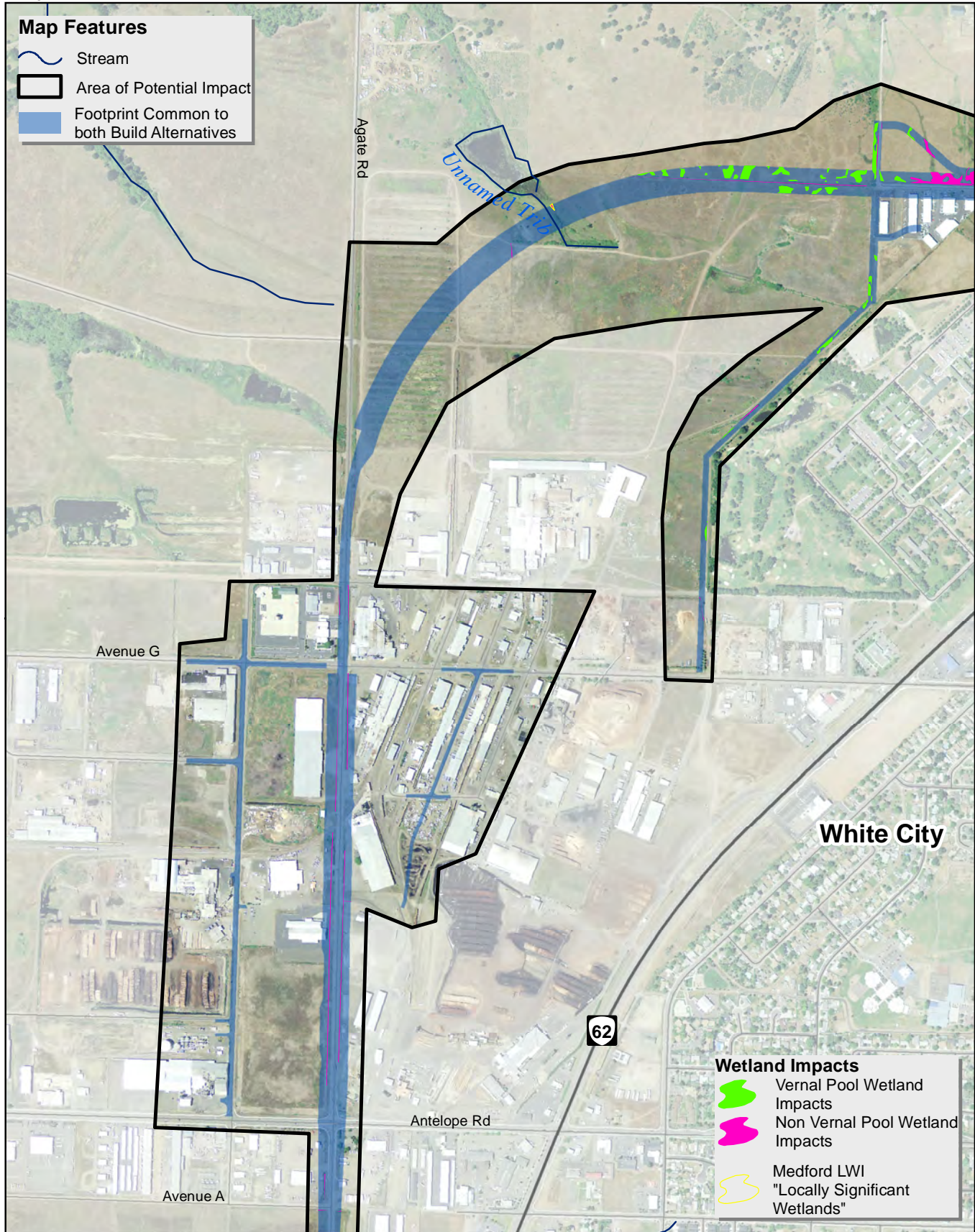
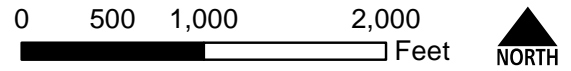
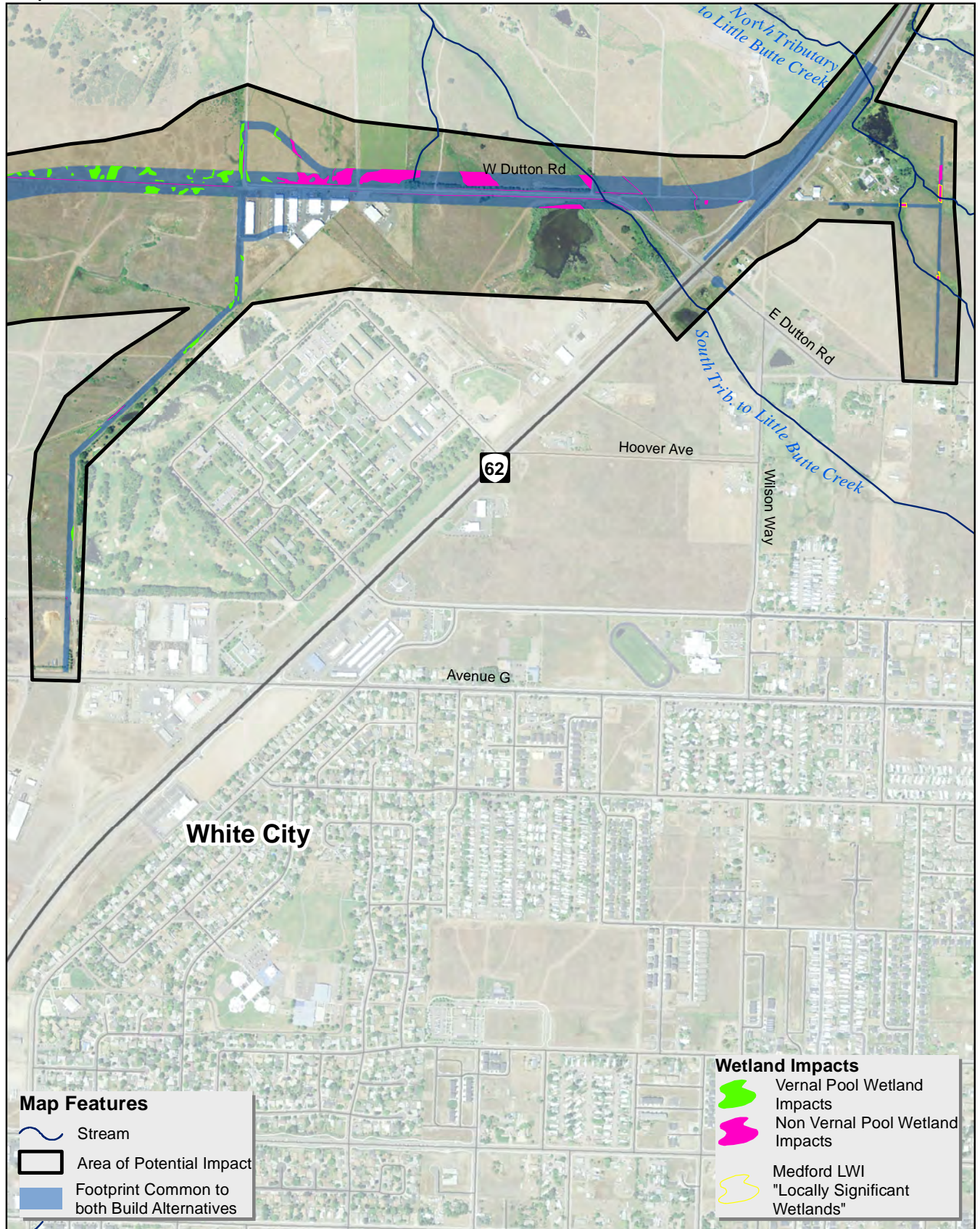
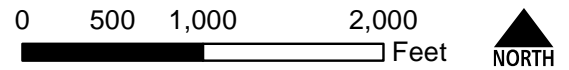


Figure 3.12-7

**Potential Wetland Impacts -
North Terminus**
September 2012



JTA Phase

The JTA phase would also directly impact wetlands as shown in Table 3.12-2. Wetland impacts from the JTA phase would range from 11.8 to 14.3 acres, depending upon the design option chosen. JTA phase Design Option C would directly impact 1.3 acres more than JTA phase Design Option A and 2.5 acres more than JTA phase Design Option B. JTA phase Design Option A would result in approximately 0.1 acre more impacts on high quality wetlands than either JTA phase Design Options B or C. A majority of high quality wetland impacts occur in the area common to all JTA phase design options. Vernal pool impacts from the JTA phase would range from 0.6 acres with JTA phase Design Option B to 1.1 acres with JTA phase Design Option C, as summarized in Table 3.12-2. Figure 3.12-8 shows potential wetland impacts for the JTA phase.

The design refinements that have occurred since the publication of the DEIS have resulted in a reduction of impacts to wetlands with the JTA phase. The removal of the new roadways to connect to the USCIS facility from Vilas Road will result in a 0.3 acre reduction in impacts to wetlands classified as high quality and vernal pools. The removal of the extension of Crater Lake Avenue to Gramercy Drive will result in a 0.5 acre reduction in impacts to medium quality wetlands. The JTA phase will not impact the newly delineated vernal pools on the Wilson property. Table 3.12-2 summarizes the direct impacts on low, medium and high quality wetlands and vernal pools for the JTA phase.

Table 3.12-2 Impacts on High, Medium, and Low Quality Wetlands and Vernal Pools by JTA Phase Design Option (Acres)

Wetland Quality	Design Option		
	A	B	C (Preferred Alternative)
Low	10.5	9.7	11.4
Medium	1.8	1.6	2.4 1.9
High	0.7	0.6	0.6 0.3
Total Impact ^{1,2}	13.0	11.8	14.3 13.6
Vernal Pools ³	1.0	0.6	1.1 0.8

Notes:

¹The total is a sum of low, medium, and high quality wetlands.

²Totals for Design Option B and C do not add up due to rounding.

³Vernal Pools are a subset of medium or high quality wetlands

Source: Wetlands Resources Technical Report

3.12.3.2 Indirect Impacts

Indirect impacts on wetlands are related to hydrologic changes to wetlands and/or vernal pools due to storm water runoff alteration, pollutant loading, increased human activity, and litter. Indirect impacts also include impacts from increased or decreased development potential associated with the project.

No Build Alternative

As described in Section 3.2, build-out of the land within existing UGBs of Medford and Eagle Point and the White City UUCB would likely occur under the No Build Alternative, but plan amendments and zone changes to allow larger-scale development would be constrained. This development, although constrained, could result in the generation of additional storm water volumes and pollutant loads that could reach wetlands, compared to current volumes and loads. Within the City of Medford and areas managed by Rogue Valley Sewer Services, some of these impacts would be reduced by the inclusion of storm water management facilities or use of low impact development approaches in site design.

Build Alternatives and JTA Phase

Indirect impacts for both build alternatives would be similar, because both the SD and DI Alternatives would likely result in the same types of hydrologic impacts. The construction of either build alternative could alter surface drainage patterns and modify storm water flows to local wetland resources. Redirecting flows could reduce supporting hydrology resulting in permanent drying or draining of wetlands. Disruption of vernal pool water flow and/or changes in seasonal flooding could alter vernal pool species composition. For example, vernal pools that prematurely dry up may prevent certain plants, insects, or amphibians from reproducing, which could result in diminished populations of certain plant and/or animal species.

As described in Section 3.2, Land Use, the build alternatives and JTA phase could accelerate land development allowed by the Medford, Eagle Point, and Jackson County comprehensive plans, including within the White City UUCB, and reduce constraints on plan amendments and zone changes to allow larger-scale development within the Medford and Eagle Point UGBs. Such larger-scale development could cause increased storm water runoff, which could also cause indirect impacts on nearby wetlands. However indirect impacts from larger-scale development would not necessarily be more than those under the No Build Alternative. Under Design Option C, the proposed roadway would be located on an existing road berm which presumably has already altered the hydrology in this location. Therefore Design Option C is expected to have the least indirect impact on the surrounding groundwater and surface water. Impacts on storm water runoff and BMPs that would reduce those impacts are discussed in more detail in Section 3.10.3.

Figure 3.12-8

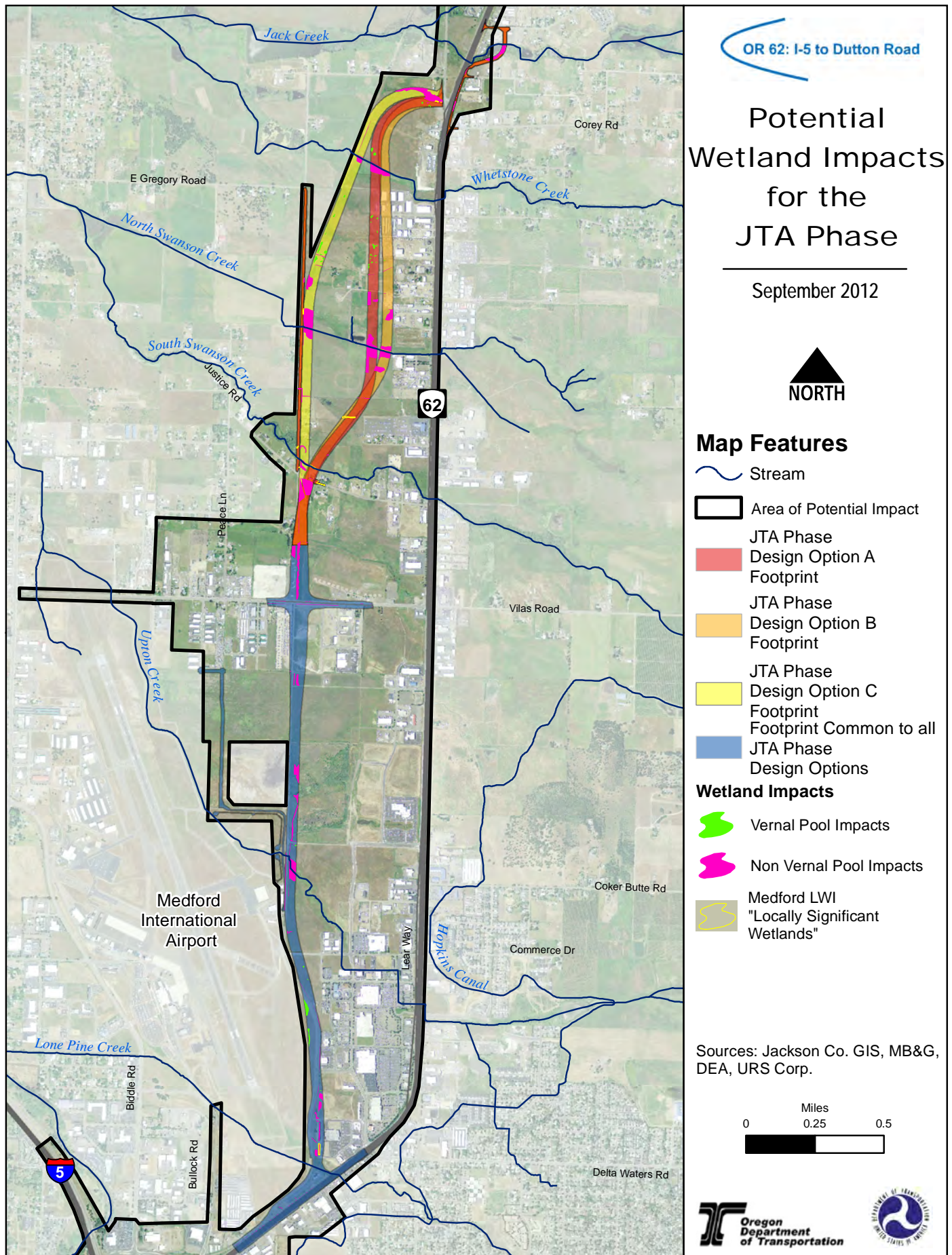
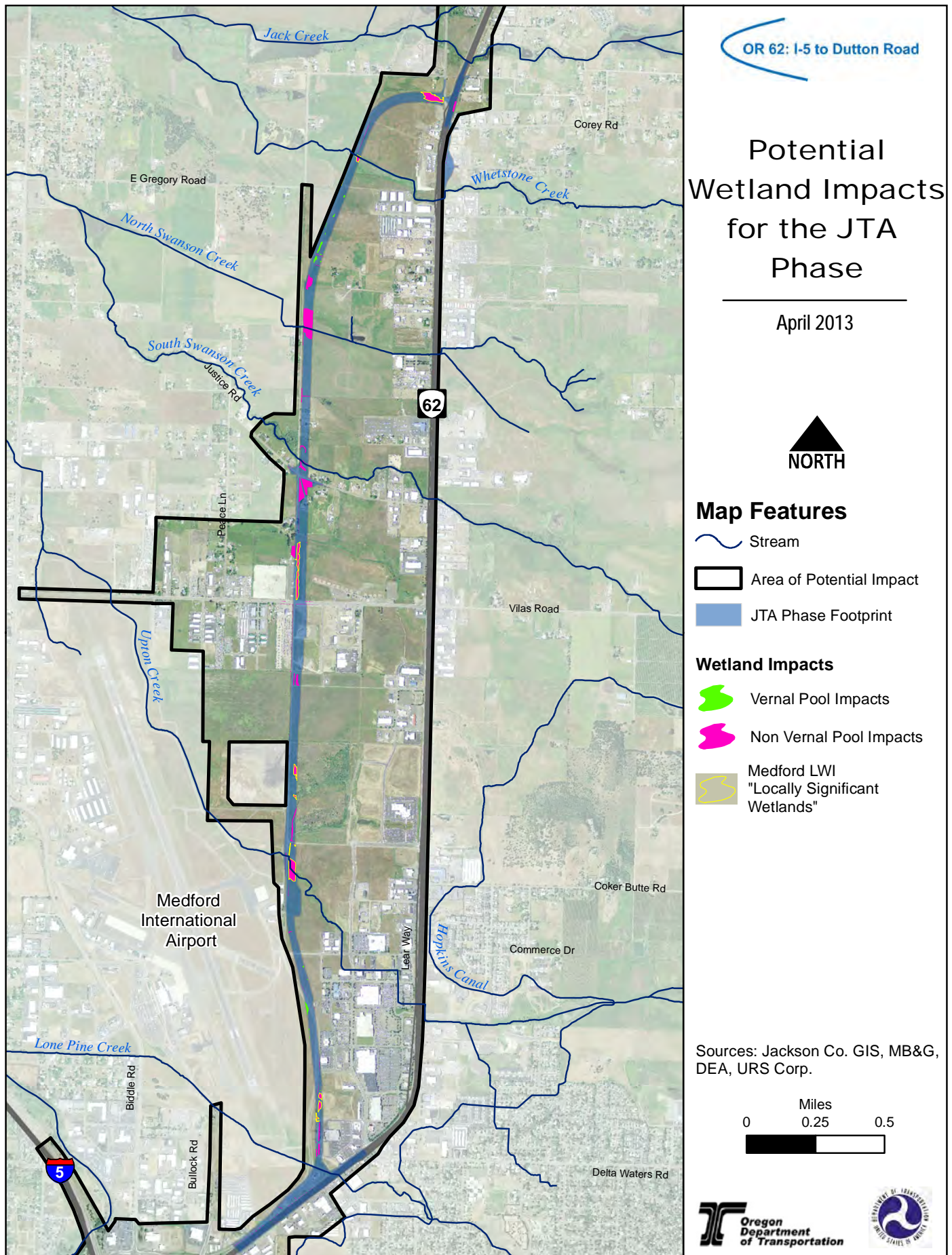


Figure 3.12-8 FEIS



3.12.3.3 Construction Impacts

Construction impacts on wetland and water resources would be temporary and could be related either to erosion from disturbed soil or to temporary fills within stream channels for construction of new or replacement stream crossings.

No Build Alternative

Under the No Build Alternative, there would be no construction impacts associated with the project.

Build Alternatives and JTA Phase

Standard construction practices would be used to construct the project, including the use of various BMPs for erosion and sediment control as described in Section 3.10.3.3. Significant construction impacts on wetlands are not anticipated with BMPs in place.

3.12.3.4 Agency Coordination

The wetlands analysis was developed in coordination with several federal and state regulatory agencies including the Corps and DSL. This coordination included several scoping meetings, office briefings, and site visits, which provided opportunities to inform the agencies of project updates and solicit comments related to wetlands and vernal pools. The USFWS was also coordinated with for the vernal pool analysis, which is described in more detail in Section 3.13. USFWS, Corps and DSL representatives are also part of the Collaborative Environmental and Transportation Agreement for Streamlining (CETAS), which was instrumental in the development of the design options for the build alternatives. These design options arose through an attempt to avoid and minimize impacts on vernal pool habitat following input from CETAS.

3.12.3.5 Required Permits

A Section 404 Corps permit and a removal-fill permit from DSL would be required for all build alternatives, design options, and phases.

3.12.3.6 Only Practicable Alternative Finding

Per Executive Order 11990 and 23 CFR 777.3, FHWA must avoid undertaking or providing assistance for new construction located in wetlands unless the agency finds that there is no practicable alternative to such construction, and that the proposed action includes all practicable measures to minimize harm to wetlands which may result from the project.

Wetlands within the API are generally associated with east-west streams that cross the API or they are part of a vernal pool complex, which is dispersed between the east and west boundaries of the API. Due to this nature of wetland dispersal throughout the study area, as shown in Figure 3.12-2, both build alternatives and all three design options would result in wetland impacts.

Throughout the design process, ODOT has looked for opportunities to avoid and minimize wetland impacts. Evidence of this can be seen in the reduction of wetland impacts between the DEIS and the FEIS, which is the result of design changes near high quality wetland areas. Further, ODOT is working to avoid and minimize wetland impacts by: (1) designing stormwater treatment to minimize impact on existing wetlands, (2) constructing a vernal pool wetland mitigation enhancement and restoration site ahead of time to avoid temporal losses of wetland functions, (3) applying best management practices for erosion and sediment control, and (4) restoring temporary wetland impacts following construction and monitoring such areas to ensure that restoration actions were successful.

Between the common elements of the two build alternatives considered, the SD Alternative, as studied in the DEIS, would have slightly more wetland impact (0.5 acres) than the DI Alternative. However, as explained in Section 2.5, while both alternatives would meet the Project Purpose and Need, the SD Alternative better meets the need for a roadway system hierarchy, better improves traffic operations, and avoids the severe reductions in connections to and from businesses near the southern terminus that the DI Alternative would cause. Due to the small difference in wetland impacts relative to the scale of the project, the SD Alternative is the most practicable alternative.

Among the three design options considered, all would impact wetlands. Although Design Option B would impact the least amount of wetlands, it was determined to be the least practicable due to property takings and associated socioeconomic impacts. Impacts to medium and high quality wetlands are the same for Design Options A and C. However, Design Option C impacts slightly more low quality wetlands. These wetland impacts are associated with flood-irrigated wetland pasture on slopes. This type of wetland provides very low levels of wetland functionality with regard to habitat, water quality, or hydraulic functions.

Based upon the above considerations, it is determined that there is no practicable alternative to the proposed construction of the Preferred Alternative, SD with Design Option C, in wetlands. The action includes all practicable measures to minimize harm to wetlands which may result from construction of the new roadway, as outlined in Section 3.12.5.

3.12.4 Avoidance, Minimization, and/or Mitigation Measures

Both build alternatives, all three design options, and the JTA phase would have unavoidable impacts on wetlands and waterways. This section describes proposed measures to avoid, minimize, and mitigate those impacts.

3.12.4.1 Direct Impacts

Avoidance and Minimization

Wetland and vernal pool avoidance was taken into consideration in the formulation of the design options. In addition, avoidance and minimization measures would be employed during the final design and construction stages. Total avoidance of wetland and waterway impacts would not be practicable due to the wide-spread presence of wetland and water features crossing the proposed alternatives within the API. Although total avoidance is not practical, additional measures that could further avoid or minimize impacts on wetlands and other waters include:

- Where warranted, reduce the overall project footprint near wetlands and waters by incorporating design changes, such as steepened side slopes or mechanically stabilized earth retaining walls;
- At proposed wetland crossings, limit disturbance to the minimum extent necessary;
- Specify that all disturbed areas should be protected from erosion within seven calendar days of completion of the project using vegetation or other means; and
- Restore all disturbed wetland areas in accordance with current wetland protection regulations and approved restoration plans. Restore with native wetland species. Control re-establishment of invasive species at proposed stream crossings and along the project alignment.

Compensatory Wetland Mitigation

Compensatory Wetland Mitigation (CWM), which aims to replace functions and values of impacted wetlands, would be needed to compensate for unavoidable adverse impacts on wetland and other water resources. ODOT is in the process of designing and implementing a permittee-responsible vernal pool mitigation site near the API in White City. This site is expected to mitigate for all of the project-related wetland impacts. Both the Corps and DSL have agreed that the site can be used to mitigate for both vernal pool and non-vernal pool wetlands due to the rarity and uniqueness of vernal pools. Because vernal pool habitat provides critical habitat for three species listed under the ESA, the functions provided by the restored vernal pools are considered to satisfactorily replace the functions and values of all vernal pool and non-vernal pool wetlands that could be impacted by the project.

The permittee-responsible vernal pool mitigation site is called the Kincaid Property Mitigation Site (KPMS) and is shown in Figure 3.12-9 FEIS. Construction of the KPMS property will replace lost wetland functions and values stemming from the OR 62 project by preserving, restoring, and enhancing vernal pool complex habitat. The proposed mitigation plan for the KPMS property will reverse past disturbance to vernal pool complex habitat having resulted from agricultural grading activities in the 1920s and 1950s. Historical vernal pool basins and interconnecting flow paths were filled as mound soils were pushed into basins and flow paths in an attempt to level the site and remove shrubs and trees. Remnant basins remaining onsite range from low functioning, weakly expressed basins dominated by weedy annual grasses to a small number of higher functioning, strongly expressed basins dominated by native vernal pool species. VPC restoration and enhancement will be accomplished by excavating the historic fill from degraded basins and flow paths. Areas of current high quality basins will be preserved and protected. Historical aerial photography will be used to guide restoration efforts. The restored/enhanced landscaped will result in high functioning vernal pool habitat that will support native vernal pool plants and animals communities.

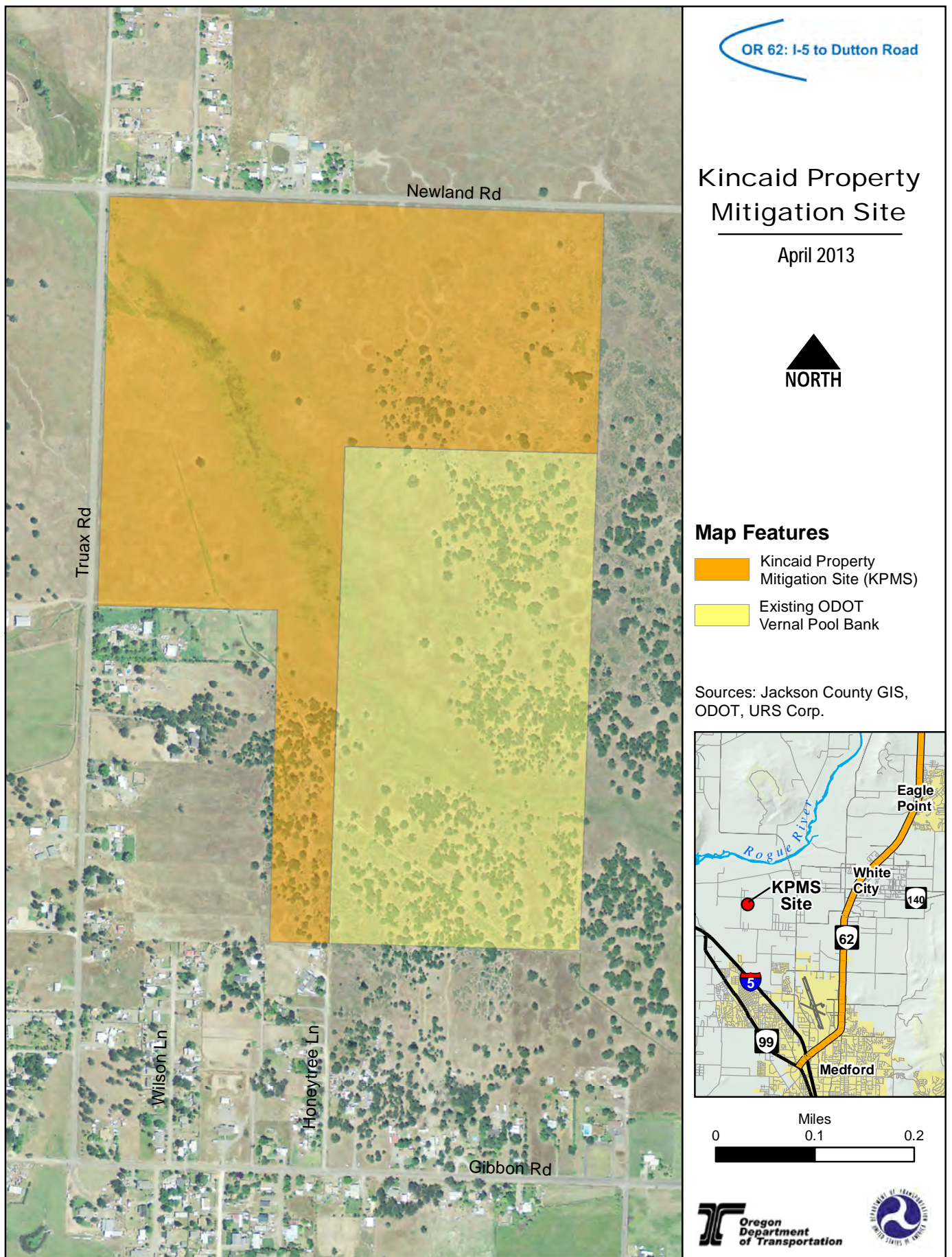
The KPMS property contains 116 acres in total. To mitigate wetland impacts associated with the JTA phase, ODOT proposes to develop 63 acres of the KPMS property (approximately half of the site) located north of a seasonal swale that bisects the property. For the JTA phase, 17 acres of the KPMS site will be temporarily impacted by enhancement and restoration activities and 6 acres of the KPMS site will be preserved. During construction of the mitigation site, temporal wetland impacts will be minimized by following ODOT's best management practices for erosion and sediment control. Seed from existing native vegetation will be collected and used to re-establish native vegetation after grading is completed. This technique has been used successfully by ODOT on the adjacent Vernal Pool Mitigation/Conservation Bank.

Construction of the KPMS mitigation site for the JTA-related wetland impacts will generate up to 30 mitigation credits, which will be more than enough to mitigate the proposed impacts described in Table 3.12-2. The remainder of the KPMS property will be available for future restoration and enhancement activities that can generate additional mitigation credits, if needed, to offset wetland impacts associated with the future full build out of the OR 62 project.

Impacted wetland ditches, which currently provide storm water treatment, would be functionally mitigated onsite by creating new storm water infrastructure as described in Section 3.10.3.

Mitigation measures are being developed in coordination with USFWS, the Corps, DSL, and ODFW to address impacts expected from the preferred alternative. The proposed CWM would involve several years of wetland monitoring and management activities to ensure successful mitigation.

Figure 3.12-9 FEIS



3.12.4.2 Indirect Impacts

Maintaining local surface hydrology patterns is a key element to mitigate for indirect impacts. During project planning and construction, project engineers would likely design and construct storm water management facilities in accordance with current state and federal water quality standards to ensure that the project does not adversely contribute to the long-term decline or alteration of water quality in adjacent wetlands and waters. Efforts would be made to avoid concentrated discharges or disruptions of surface and subsurface hydrology that could disrupt existing hydrologic balance of avoided wetlands.

3.12.4.3 Construction Impacts

To avoid and minimize overall wetland and waters impacts during project construction, the project would include various BMPs for erosion and sediment control, vegetation protection, site restoration, and planting. Specific measures could include:

- Locate construction staging areas and construction access away from wetlands and waters.
- Identify all wetland and water crossings in the field prior to construction.
- Wetlands that can be avoided will be marked off as “no work areas”.
- Prevent construction debris from entering surface waters by using containment measures.
- Route wastewater from construction activities and dewatering discharges away from wetlands.
- Provide temporary settling basins for settlement of fine sediments and other contaminants prior to being discharged back into wetlands.
- Prohibit the discharge of pollutants of any kind (e.g., petroleum products, uncured concrete, silt, sandblasting material, welding slag, etc.) into wetlands.
- Prohibit discharges of water having had contact with newly-poured concrete (within 24 hours of pour) into wetlands. Recommend use of moist burlap, or an approved equal, for concrete curing.
- As appropriate, schedule construction activities near wetlands and waters so that they occur during the drier months of the year (July through September).
- Locate all equipment and material staging areas in previously cleared and disturbed areas within the project area to the extent practicable to minimize additional disturbance impacts on wetlands, waters, and adjacent riparian areas.

3.12.5 Avoidance, Minimization, and/or Mitigation Commitments Incorporated into the Preferred Alternative

ODOT makes the following commitments.

3.12.5.1 Project Design JTA Phase

ODOT will mitigate off-site for all direct wetland impacts anticipated from the JTA phase by preserving and enhancing wetlands at the KPMS described in Section 3.12.4.1. The KPMS is expected to yield 30 mitigation credits. One mitigation credit can mitigate for up to 1 acre of permanent wetland impacts. The 30 mitigation credits will be more than enough to offset the 13.6 acres of anticipated wetland impacts resulting from construction of the JTA phase. Mitigation credits in excess of those needed for the JTA phase project will be retained for future phases of the OR 62: I-5 to Dutton Road project (see below).

JTA Phase and Preferred Alternative Subsequent to Construction of the JTA Phase

- ODOT will minimize the overall project footprint near wetlands and waters by incorporating steepened side slopes or mechanically stabilized earth retaining walls where warranted.
- ODOT, where appropriate and feasible, will design the project to maintain local surface hydrology patterns supporting wetlands and waters.
- ODOT will minimize disturbance at wetland crossings.
- ODOT will restore with native wetland species and control re-establishment of invasive species at stream crossings and along the project alignment.

Preferred Alternative Subsequent to Construction of the JTA Phase

- ODOT plans to mitigate for the wetland impacts of phases of the Preferred Alternative subsequent to construction of the JTA phase using mitigation credits from the KPMS mitigation site referenced above. As stated above, the KPMS is expected to yield more than enough mitigation credits for the JTA phase. Mitigation credits remaining after mitigation of the JTA phase will be used to mitigate the impacts of later phases of the Preferred Alternative. Should additional mitigation credits be needed, ODOT has the option to purchase mitigation credits from the Wildlands vernal pool mitigation bank or may use forthcoming mitigation credit releases from ODOT's existing vernal pool mitigation bank. In short, ODOT has an abundance of mitigation options available to mitigate impacts to vernal pool species.
- ODOT will avoid concentrated discharges or disruptions of surface and subsurface hydrology that could disrupt existing hydrologic balance of avoided wetlands.

3.12.5.2 Project Construction

- ODOT will identify all wetland and water crossings in the field prior to construction.
- Wetlands that can be avoided will be marked off as "no work areas."
- As appropriate, ODOT will schedule construction activities near wetlands and waters so that they occur during the drier months of the year (July through September).

Section 3.13 Content

- 3.13.1 Regulatory Setting
 - 3.13.1.1 Federal
 - 3.13.1.2 State
- 3.13.2 Affected Environment
- 3.13.3 Environmental Consequences
 - 3.13.3.1 Federal ESA
 - 3.13.3.2 State ESA
- 3.13.4 Avoidance, Minimization, and/or Mitigation Measures
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 - 3.13.4.2 Riparian Habitat
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T&E SPECIES

3.13

3.13 Threatened and Endangered Species

3.13.1 Regulatory Setting

3.13.1.1 Federal

The primary federal law protecting threatened and endangered species is the federal ESA: 16 United States Code (USC), Section 1531-1544, et seq. FHWA and ODOT's responsibilities under the act are regulated at 50 CFR Part 402. This Act and subsequent amendments provide for the conservation of threatened and endangered species and the ecosystems upon which they depend. Under Section 7 of the ESA, federal agencies, such as FHWA, are required to consult with the USFWS and/or the National Marine Fisheries Service (NMFS), jointly referred to as the Services, to ensure that FHWA is not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. Section 3 of ESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

Compliance with ESA can be demonstrated through "No-Effect" documentation, which is generally prepared by the applicant (in this case ODOT). For actions which are "Not Likely to Adversely Affect" species or their critical habitat, informal consultation is conducted and typically results in a concurrence letter from the Services. For actions which are "Likely to Adversely Affect" species or their critical habitat, formal consultation is conducted. The outcome of formal consultation is a Biological Opinion (BO) which may include an incidental take authorization. Additionally programmatic approaches for ESA consultations may be available.

3.13.1.2 State

Consultation with ODFW and/or Oregon Department of Agriculture (ODA) is required when species are state-listed as threatened or endangered. State-listed fish and wildlife species are regulated by the ODFW in ORS 496.171 to 496.192. State-listed plants are regulated by the ODA in ORS 564.100 to 564.135. Wildlife "take" is defined under state law as to kill or obtain possession or control of. Plant "take" is defined under state law as to collect, cut, damage, destroy, dig, kill, pick, remove, or otherwise disturb.

3.13.2 Affected Environment

The API for this analysis is defined as the project footprint with a 250 foot buffer on all sides, as shown in Figure 3.13-1. Areas within the API have the potential to support federal and state listed plant and wildlife species. Federal and state species lists were reviewed to determine which ESA species and critical habitat could potentially occur within the API.

For further information regarding ESA species, including citations to source documents, refer to the OR 62 Corridor Solutions Project Terrestrial Resources Technical Report, November 2011 and the OR 62 Corridor Solutions Project Aquatic Resources Technical Report, July 2011. These reports are available from the ODOT contact person identified on page i of this EIS

Field surveys, habitat assessments, and coordination with local ODFW, USFWS, and NMFS biologists were conducted to determine which of the potential ESA species are known to occur within the API. Table 3.13-1 summarizes the species known or expected to occur within the API. Complete federal species lists are available in Appendix G.

Table 3.13-1 ESA Species Potentially Occurring in the API

Common Name <i>Scientific Name</i>	Federal Status	State Status	Critical Habitat Designated within API	Species Potentially Occurs within API
Aquatic Species				
Coho Salmon (<i>Oncorhynchus kisutch</i>) Southern Oregon/Northern California Coast (SONCC) ESU	Threatened	Not Listed	Yes	Yes
Terrestrial Species				
Vernal Pool Fairy Shrimp (<i>Branchinecta lynchi</i>)	Threatened	Not Listed	Yes	Yes
Plant Species				
Cook's Lomatium (<i>Lomatium cookii</i>)	Endangered	Endangered	Yes	Yes
Large-flowered Woolly Meadowfoam (<i>Limnanthes floccosa</i> ssp. <i>grandiflora</i>)	Endangered	Endangered	Yes	Yes
Coral-Seeded Allocarya (<i>Plagiobothrys figuratus</i> ssp. <i>corallicarpus</i>)	Species of Concern	Candidate	NA ¹	Yes
Southern Oregon Buttercup (<i>Ranunculus austro-oreganus</i>)	Not Listed	Candidate	NA ¹	Yes

Source: Aquatic Resources Technical Report and Terrestrial Resources Technical Report

¹ Critical habitat has not been designated for the species.

Aquatic Species and Habitat

An **Evolutionary Significant Unit (ESU)** is a sub-portion of a species that has different behavioral traits due to its isolation, and represents an important component of the evolutionary legacy of the species.

Coho salmon (*Oncorhynchus kisutch*) is the only federal ESA fish species potentially occurring within the API. Coho salmon are federally listed as threatened, but are not state-listed. The Middle Rogue River and Upper Rogue River and their tributaries, which include all streams within the API are designated critical habitat for Southern Oregon/Northern California Coast (SONCC) Coho salmon evolutionary significant unit (ESU). Bear Creek is the only stream within the API known to currently support SONCC coho salmon. Little Butte Creek also supports this species and although it is outside of the API, Little Butte Creek does receive stormwater runoff from the API via two unnamed tributaries. These streams are all shown in Figure 3.13-1.

Anecdotal records have reported SONCC coho salmon presence in Lone Pine Creek downstream of the culvert crossing at Table Rock Road, located approximately one mile downstream of the project API. This culvert is considered a partial barrier, since SONCC coho run timing typical occurs when stream flows are too low to facilitate passage such that SONCC coho would be required to jump to enter the culvert (personal communication with Doug Sharp, ODOT Region 3 Biologist and Permit Specialist, July 3, 2012). While circumstance may arise that allow SONCC coho to pass the Table Rock Road barrier, such occurrences would be unusual and habitat upstream of the culvert is generally degraded and not conducive to supporting coho. Additional partial passage barriers have been anecdotally mentioned upstream of the Table Rock Road culvert, but no confirmation of such barriers was completed for this analysis. There are no known occurrences of SONCC coho in Lone Pine Creek within the API.

Figure 3.13-1

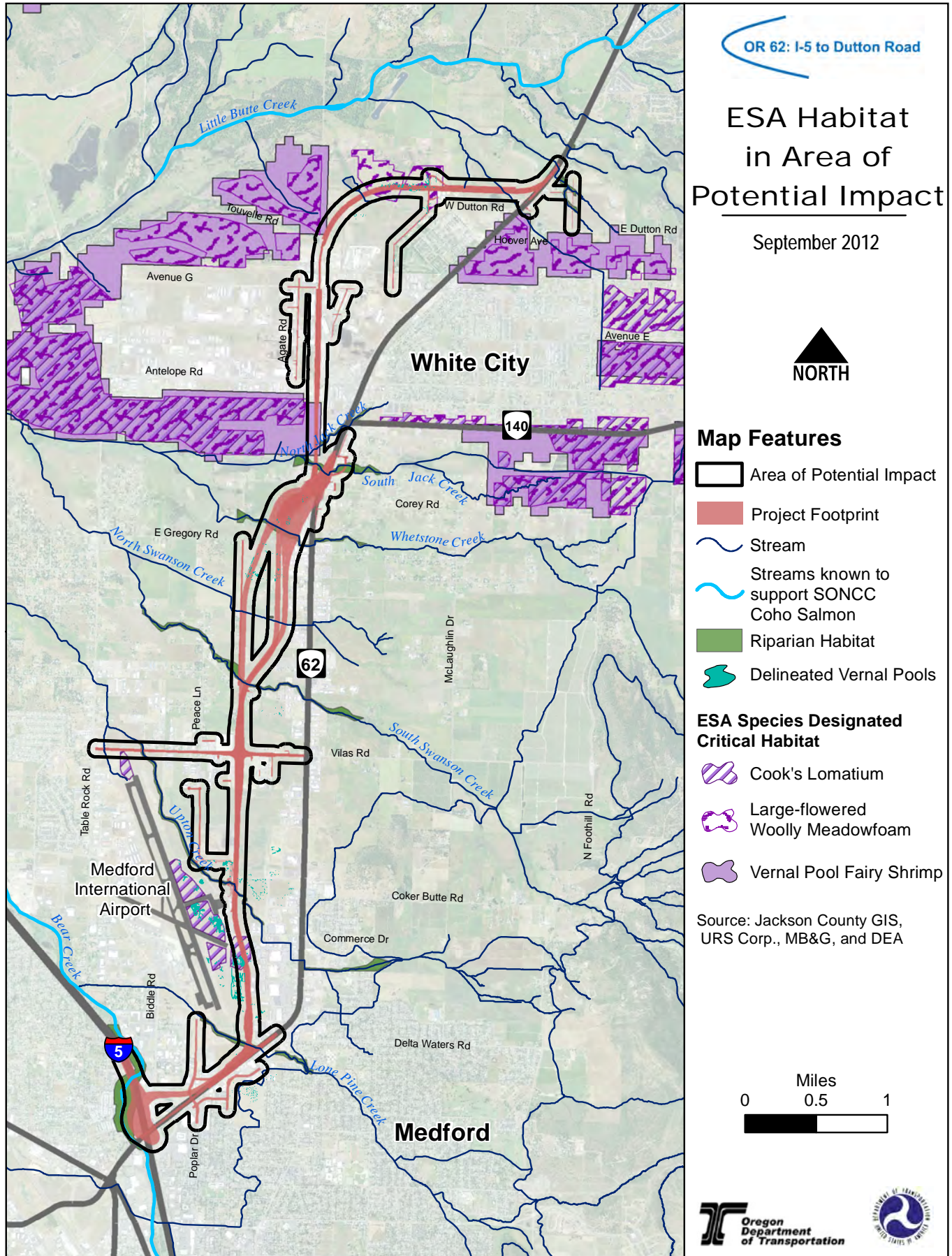
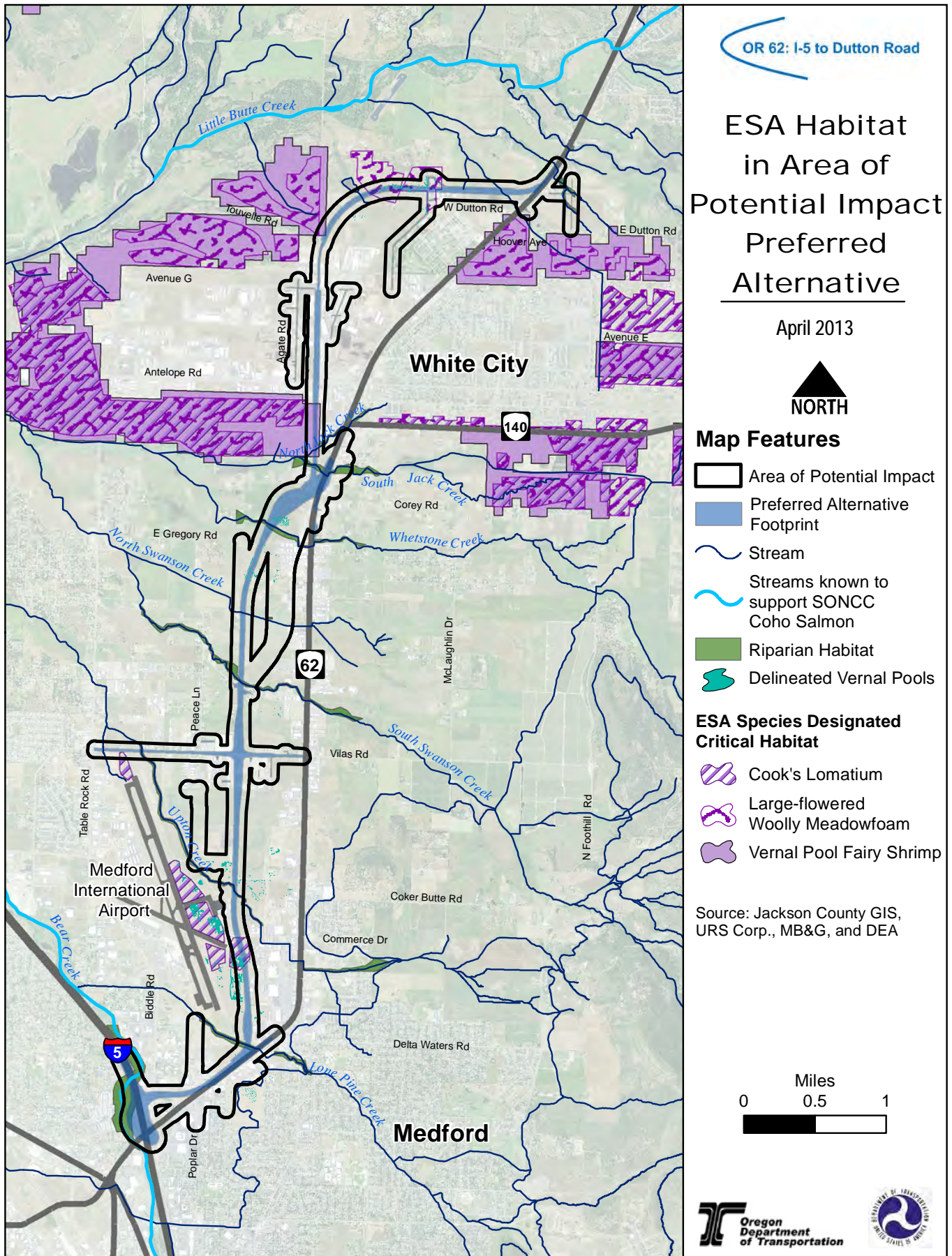


Figure 3.13-1 FEIS



It is assumed, based on historic records and anecdotal evidence, that all tributaries within the API provided historic habitat for SONCC coho salmon. Consequently, all streams in the API are designated as critical habitat for SONCC coho salmon, as there are no long-standing natural barriers that prevent upstream access from Bear Creek and the Rogue River. According to NMFS, it is likely that SONCC coho salmon use portions of Lone Pine Creek, Upton Creek, Whetstone Creek, and potentially Swanson Creek as habitat downstream and outside of the API during high flow conditions in the Rogue River and Bear Creek. However, due to barriers downstream of the API, SONCC coho salmon are unable to access the reaches of those streams within the API.

All streams within the API are water quality-limited due to several parameters described in Section 3.10.2.1 and, with the exception of Bear Creek, generally have poor riparian conditions. Fish habitat is degraded due to lack of riparian vegetation, culverted or piped segments, absence of large woody debris, silty streambeds, straightened stream channels, and high temperatures.

Terrestrial Wildlife Species and Habitat

Vernal pool fairy shrimp is the only federal ESA terrestrial wildlife species potentially occurring within the API. Vernal pool fairy shrimp are listed as threatened under the federal ESA, but are not state-listed. Vernal pools are a rare and unique habitat that vernal pool fairy shrimp rely upon for survival. To preclude the need for multi-year protocol surveys, all vernal pools within the API are assumed to support vernal pool fairy shrimp per an October 6, 2010 meeting between ODOT and USFWS. Designated vernal pool fairy shrimp critical habitat within the API, is indicated on Figure 3.13-1. Areas of mapped designated critical habitat for vernal pool fairy shrimp include portions of the existing Agate Road and a few areas east of Agate Road that lack the habitat characteristics necessary for survival and reproduction of vernal pool fairy shrimp. These areas on existing Agate Road and east of Agate Road are assumed by ODOT to be mapping errors. This information was communicated to USFWS in the October 6, 2010 meeting as well as outlined in the Terrestrial Biological Assessment submitted for this project on December 22, 2011. The impact analysis for vernal pool fairy shrimp focuses on impacts on field-identified vernal pools and mapped designated critical habitat. Areas of designated critical habitat that are considered a result of mapping error were not included in the impact analysis. The majority of the vernal pools in the API have been degraded by the invasion of non-native plants, grazing, agricultural practices, road construction and illegal trash dumping. There are no known state-listed wildlife species in the API.

Plant Species and Habitat

The four plant species listed as endangered, threatened, or candidate species on either the federal or state ESA lists that potentially occur in the API are included in Table 3.13-1. Field investigations indicate that Cook's lomatium, large-flowered woolly meadowfoam, and southern Oregon buttercup occur within the API. Cook's lomatium and large-flowered woolly meadowfoam are listed on federal and state ESA lists and southern Oregon buttercup is a state-listed candidate species.

Cook's lomatium generally prefers vernal pool edges or other seasonally wet areas. USFWS designated critical habitat for Cook's lomatium occurs within the API near Upton Creek and adjacent to the API near North Jack Creek as shown in Figure 3.13-1. These areas are considered genetically important because these are the species' southernmost known populations.

Large-flowered woolly meadowfoam prefers the inner, wetter ring of vernal pools. USFWS designated critical habitat for large-flowered woolly meadowfoam occurs within the northern portion of the API surrounding West Dutton Road, as shown in Figure 3.13-1.

Southern Oregon buttercup prefers damp or dry grassy loam slopes between 1,500 and 2,000 feet in elevation. Critical habitat has not been designated for this species; however, a population is known to exist in the southern portion of the API. While this population is within the API boundary it is separated from the project footprint by an irrigation ditch. This ditch creates a barrier between the project and the species, so the Southern Oregon buttercup would not be directly or indirectly impacted by project activities. Additional potentially-suitable, but un-surveyed habitat for southern Oregon buttercup is present

within the API. Un-surveyed, suitable habitat has the potential to support southern Oregon buttercup. Some areas have not been surveyed due to lack of consent from private land owners and new areas added to the project that were previously outside the project's boundaries. Off-site methods such as air photo interpretation were used to evaluate those areas.

Coral-seeded allocarya is associated with seasonal creeks and vernal pool habitats between 1,500 and 2,000 feet in elevation. The API contains areas that may be suitable habitat for coral-seeded allocarya; however this species has not been observed during botanical field surveys done to date. The Terrestrial Resources Technical Report provides more information on field surveys conducted.

Because the known population of southern Oregon buttercup is isolated from possible project impacts by an irrigation ditch and the presence of coral-seeded allocarya is unknown, potential impacts on these species are not discussed in the following sections. Pre-construction surveys would be conducted if a build alternative is chosen and if listed species are encountered, impacts would be minimized, where possible.

3.13.3 Environmental Consequences

3.13.3.1 Federal ESA

Direct Impacts

No Build Alternative

The No Build Alternative would not cause loss, modification, or enhancement of existing populations of federal ESA species.

Build Alternatives

Aquatic Species and Habitat

Direct impacts on aquatic federal ESA species and critical habitat from the build alternatives are limited to short term impacts during the construction phase, and are discussed later in this Section under Construction Impacts.

Terrestrial Wildlife Species and Habitat

Both build alternatives would have the same type and magnitude of direct impacts on vernal pool fairy shrimp. Direct impacts on vernal pool fairy shrimp were assessed by calculating the number of acres of impacts on its field delineated habitat, vernal pools, as well as mapped designated critical habitat. Direct impacts on delineated vernal pools were calculated as the amount of acres of vernal pools that would be entirely or partially within the build alternatives' footprints. The direct impacts that would result include permanent filling of the vernal pools or compromising their ecological function. The methods used to calculate impacts were established by the USFWS in the Programmatic Formal Consultation on the U.S. Fish and Wildlife Service's Vernal Pool Conservation Strategy for Jackson County, Oregon (PFC) (USFWS 2011). The PFC provided the methodology and guidance employed to assess impacts on vernal pool-associated listed species. The methods are described in detail in the Terrestrial Resources Technical Report.

As shown in Table 3.13-2, both build alternatives would directly impact 4.8 acres to 5.5 acres of vernal pools, depending on the design option chosen. Design Option C would impact the most vernal pools: 0.2 acre more than Design Option A and 0.7 acre more than Design Option B. Direct impacts on designated critical habitat were calculated as the acres of designated critical habitat present within the project footprint. Based on this conservative calculation, both build alternatives would directly impact 7.0 acres of vernal pool fairy shrimp designated critical habitat. However most or all, of the mapped designated critical habitat in this area actually occurs in developed areas, such as streets, and is considered a mapping error. Therefore actual direct impacts on vernal pool fairy shrimp designated critical habitat would be minimal. Figures 3.13-2 through 3.13-4 show vernal pools that would be impacted by the build alternatives.

The design refinements that have occurred for the FEIS have resulted in a reduction of impacts to vernal pools. The removal of the new roadways to connect to the USCIS facility from Vilas Road will result in a 1.1 acre reduction in direct impacts to vernal pools. The vernal pools on the Wilson property in the vicinity of Whetstone Creek that have been added to the wetland delineation since the publication of the DEIS have resulted in an increase of 0.7 acres of vernal pools directly impacted. This results in a net reduction of 0.4 acres of direct impacts to vernal pools for the Preferred Alternative, for a total direct impact of 5.1 acres. Table 3.13-2 includes the updated acreage of vernal pool impacts associated with the Preferred Alternative. The vernal pool impacts under the Preferred Alternative are shown in Figures 3.13-2 FEIS and 3.13-3 FEIS.

These numbers differ from the numbers reported in Section 3.12 Wetlands and Other Waters because the regulatory agencies for wetlands and for threatened and endangered species habitat require different assessment methodologies. The numbers reported for vernal pool impacts in Section 3.12 are limited to the portions of vernal pools that the project footprint would overlap. The numbers reported for vernal pool impacts in Section 3.13 include the entire vernal pool, even if only a portion of the vernal pool is overlapped by the project footprint.

Additionally, the methodology used to calculate impacts to vernal pool fairy shrimp designated critical habitat was modified by the USFWS in March 2013. The revised method was employed to refine impact numbers reported in the 2011 PFC. The original methodology for calculating direct impacts to critical habitat looked only at areas where the project boundaries overlapped the critical habitat polygons. Under the revised methodology, direct impacts are considered only for impacts where the project boundaries overlap delineated vernal pool wetlands that occur within critical habitat polygons. Consequently, the impact values have decreased from those reported in the DEIS. Under the revised assessment methodology, there are no anticipated direct impacts to vernal pool fairy shrimp critical habitat from the preferred alternative. Table 3.13-2 includes the revised acreage impacts associated with the Preferred Alternative.

Table 3.13-2 Direct Impacts on Federal ESA Terrestrial Wildlife and Plant Species by Build Alternative and Design Option

Resource Evaluated	SD Alternative			DI Alternative		
	Design Option A	Design Option B	Design Option C (Preferred Alternative)	Design Option A	Design Option B	Design Option C
Vernal Pools (Acres)	5.3	4.8	5.5 5.1	5.3	4.8	5.5
Vernal Pool Fairy Shrimp Designated Critical Habitat (Acres) ¹	7.0	7.0	7.0 0.0	7.0	7.0	7.0
Cook's Lomatium Designated Critical Habitat (Acres)	5.1	5.1	5.1 0.4	5.1	5.1	5.1
Cook's Lomatium Individuals	1	1	1	1	1	1
Large-flowered Woolly Meadowfoam Designated Critical Habitat (Acres)	13.7	13.7	13.7 2.5	13.7	13.7	13.7
Large-flowered Woolly Meadowfoam Individuals	260	260	260	260	260	260

Notes:

¹ Acreage of Vernal Pool Fairy Shrimp designated critical habitat impacts as reported, includes mapping errors resulting from the scale at which the designated critical habitat was designated. It includes streets and other developed areas, and is considered to be highly conservative.

Source: Terrestrial Resources Technical Report

Plant Species and Habitat

Both build alternatives and all design options would have the same direct impacts on Cook's lomatium and large-flowered woolly meadowfoam. Direct impacts on these plant species were based on acres of designated critical habitat impacted and individual plants within the project footprint that would be removed. The build alternatives would impact 5.1 acres of Cook's lomatium designated critical habitat and one individual plant. For large-flowered woolly meadowfoam, 13.7 acres of designated critical habitat and up to approximately 260 individual plants would be impacted as indicated in Table 3.13-2. These individual plant numbers are based on field surveys conducted in June 2004 and September 2007. Figures 3.13-2 through 3.13-4 show designated critical habitat for Cook's lomatium and large-flowered woolly meadowfoam that would be impacted by the build alternatives and design options.

The methodology used to calculate impacts to critical habitat for Cook's lomatium and large-flowered woolly meadowfoam was modified by the USFWS in March 2013. The revised method was employed to refine impact numbers reported in the 2011 Biological Assessment submitted by FHWA to USFWS. The original methodology for calculating direct impacts to critical habitat looked only at areas where the project boundaries overlapped the critical habitat polygons. Under the revised methodology, direct impacts are considered only for impacts where the project boundaries overlap delineated vernal pool wetlands (the required habitat of both species) that occur within critical habitat polygons. Consequently, the impact values have decreased from those reported in the DEIS. Under the revised assessment methodology, direct impacts to Cook's lomatium critical habitat decreased by 4.7 acres, to a total of 0.4 acre. Direct impacts to large-flowered woolly meadowfoam critical habitat decreased by 11.2 acres, to a total of 2.5 acres. Impacts to individuals of the species have not changed from those reported in the DEIS. Table 3.13-2 includes the revised acreage impacts associated with the Preferred Alternative.

Figure 3.13-2

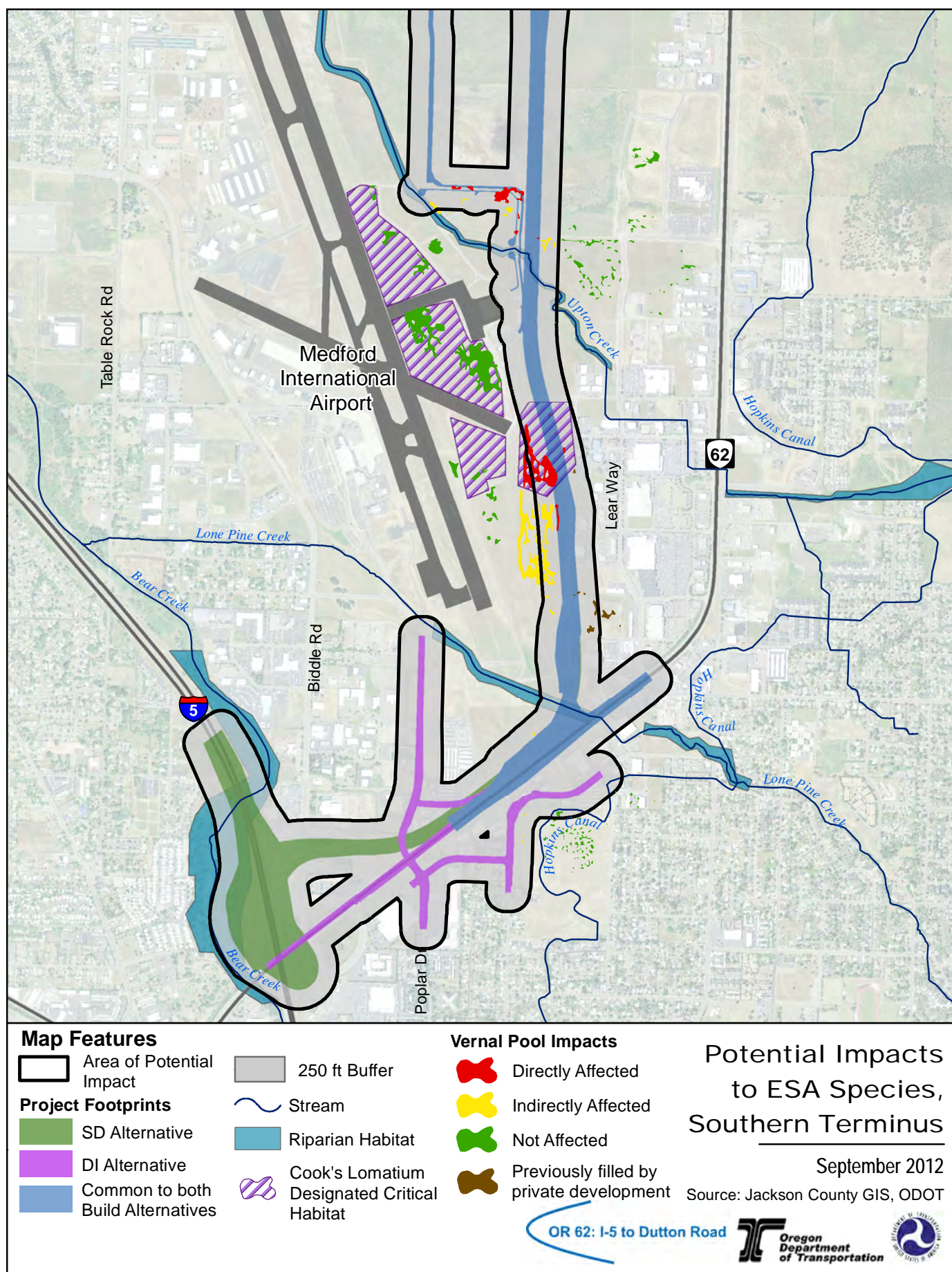


Figure 3.13-2 FEIS

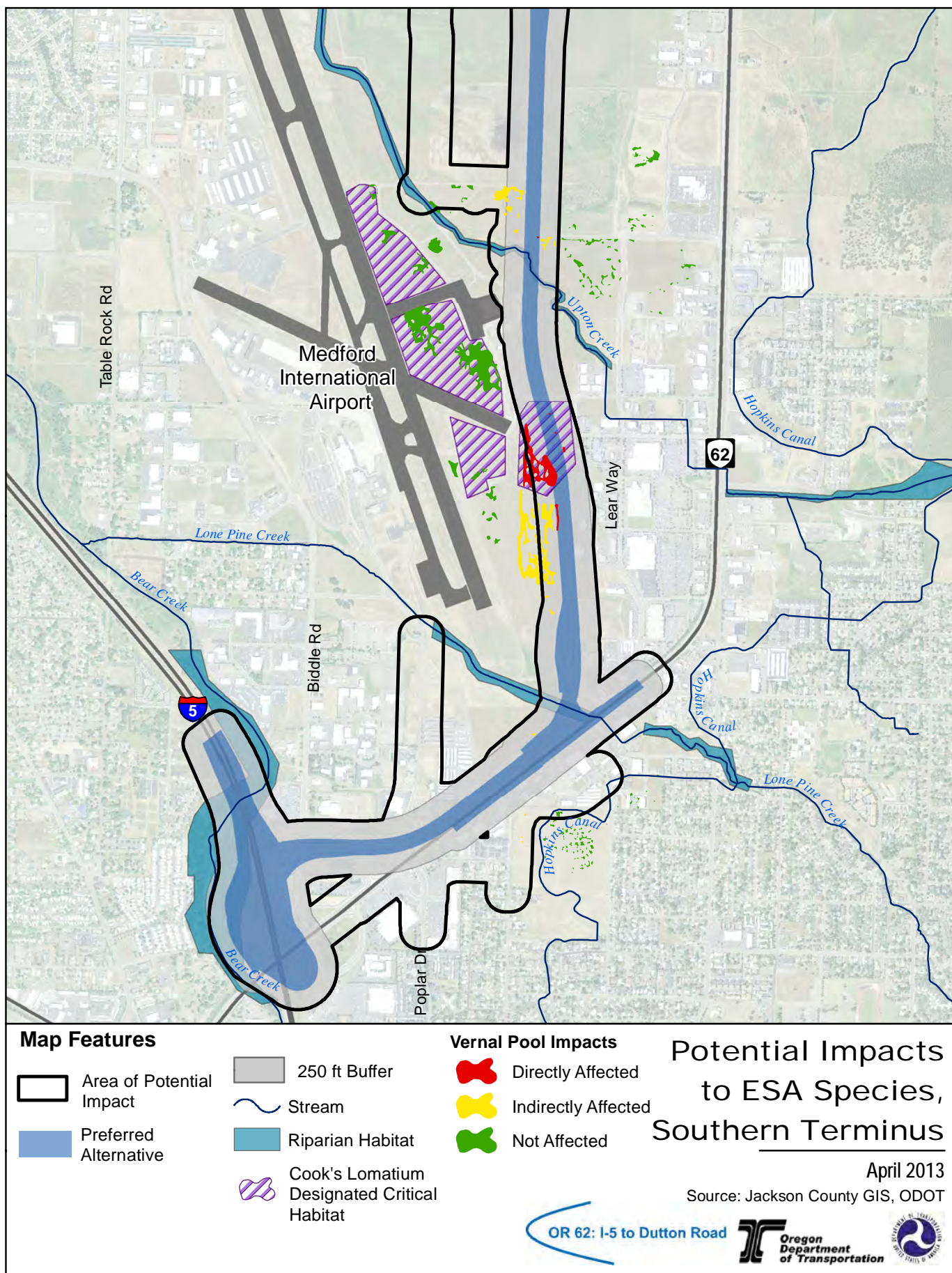


Figure 3.13-3

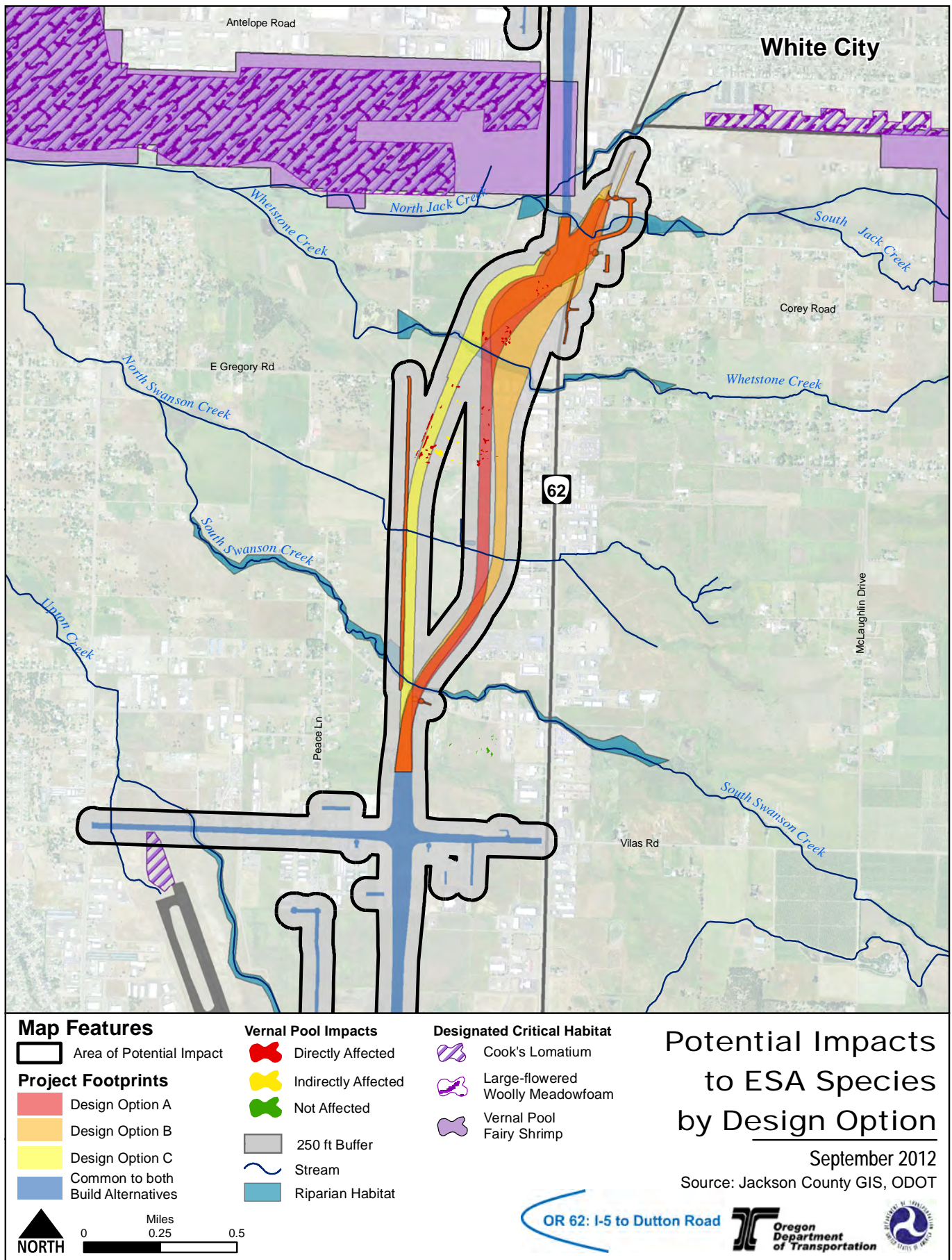


Figure 3.13-3 FEIS

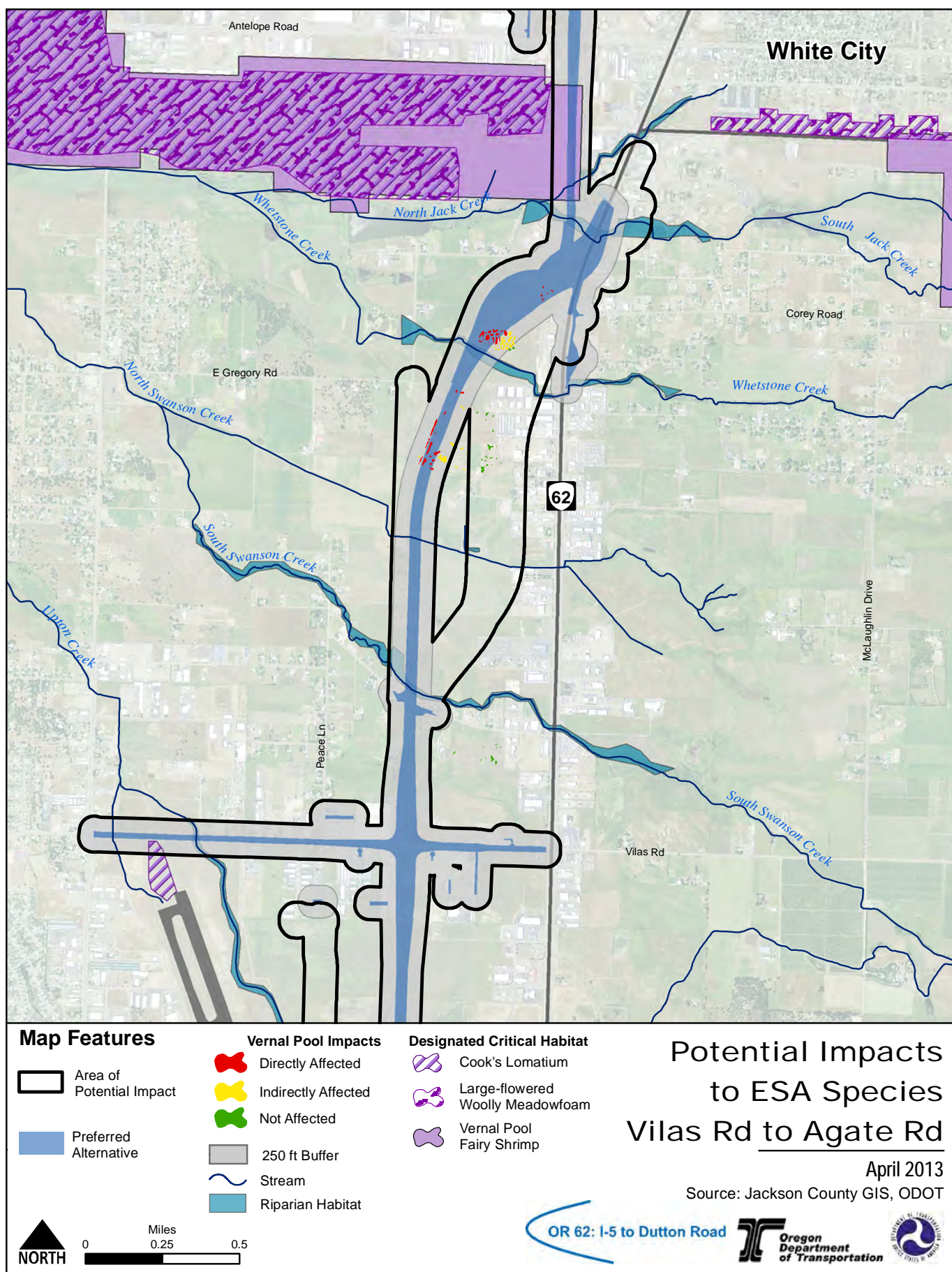
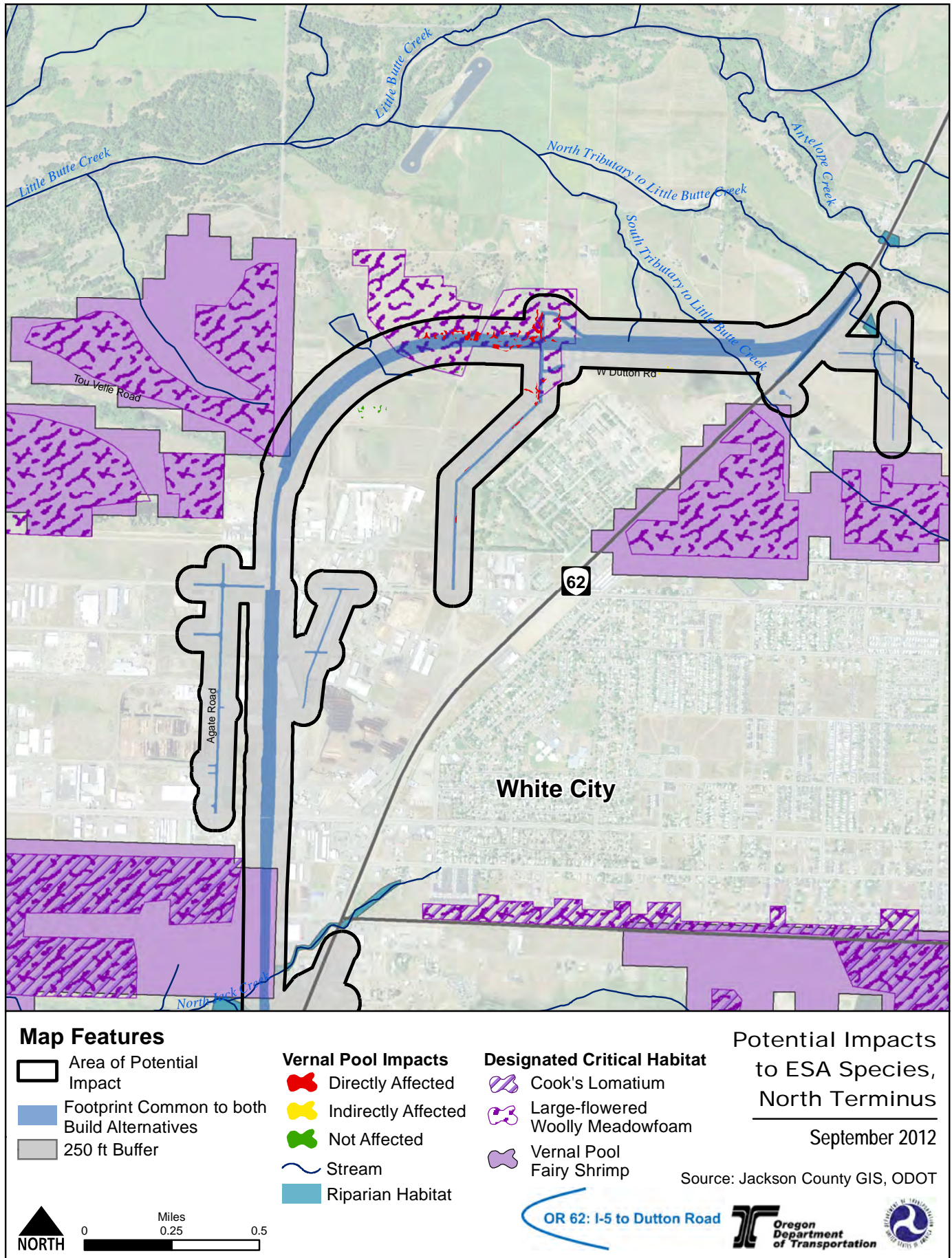


Figure 3.13-4



JTA Phase

Aquatic Species and Habitat

Direct impacts on aquatic ESA species from the JTA phase are limited to short term impacts during the construction phase and are discussed later in this Section under Construction Impacts.

Terrestrial Wildlife Species and Habitat

The JTA phase would impact 2.0 acres to 2.5 acres of vernal pools depending on the JTA phase design option chosen. JTA phase Design Option C would impact the most vernal pools: 0.3 acre more than JTA phase Design Option A and 0.5 acre more than JTA phase Design Option B. The JTA phase would not directly impact any vernal pool fairy shrimp designated critical habitat. Table 3.13-3 summarizes impacts on vernal pool fairy shrimp from the JTA phase. Figure 3.13-5 shows impacts on ESA species from the JTA phase.

The design refinements that have occurred for the FEIS have resulted in a reduction of 1.1 acres of direct vernal pool impacts under the JTA phase due to the removal of the new roadways connecting from Vilas Road to the USCIS facility. The newly delineated vernal pools on the Wilson property will not be impacted until a phase subsequent to the JTA phase is constructed. The direct vernal pool impacts under the JTA phase are shown in Table 3.13-3 and Figure 3.13-5 FEIS.

Plant Species and Habitat

The JTA phase would not impact designated critical habitat for large-flowered woolly meadowfoam. One individual Cook's lomatium plant and up to approximately 10 large-flowered woolly meadowfoam plants would be impacted by the JTA phase. The large-flowered woolly meadowfoam plants are mainly located outside of the designated critical habitat near the airport. Table 3.13-3 summarizes impacts on ESA plant species from the JTA phase.

The methodology used to calculate direct impacts to critical habitat for Cook's lomatium and large-flowered woolly meadowfoam was modified by the USFWS in March 2013. Under the revised assessment methodology, direct impacts to Cook's lomatium critical habitat decreased by 4.7 acres, to a total of 0.4 acre. Direct impacts to large-flowered woolly meadowfoam critical habitat remain unchanged. Impacts to individuals of the species have not changed from those reported in the DEIS. Table 3.13-3 includes the revised acreage impacts associated with the Preferred Alternative.

Table 3.13-3 Direct Impacts on Federal ESA Terrestrial Wildlife and Plant Species by JTA Phase Design Option

Resource Evaluated	JTA Phase Design Option		
	Design Option A	Design Option B	Design Option C (Preferred Alternative)
Vernal Pools (Acres)	2.2	2.0	2.5 1.4
Vernal Pool Fairy Shrimp Designated Critical Habitat (Acres)	0.0	0.0	0.0
Cook's Lomatium Designated Critical Habitat (Acres)	5.1	5.1	5.1 0.4
Cook's Lomatium Individuals	1	1	1
Large-flowered Woolly Meadowfoam Designated Critical Habitat (Acres)	0.0	0.0	0.0
Large-flowered Woolly Meadowfoam Individuals	10	10	10

Source: Terrestrial Resources Technical Report

Figure 3.13-5

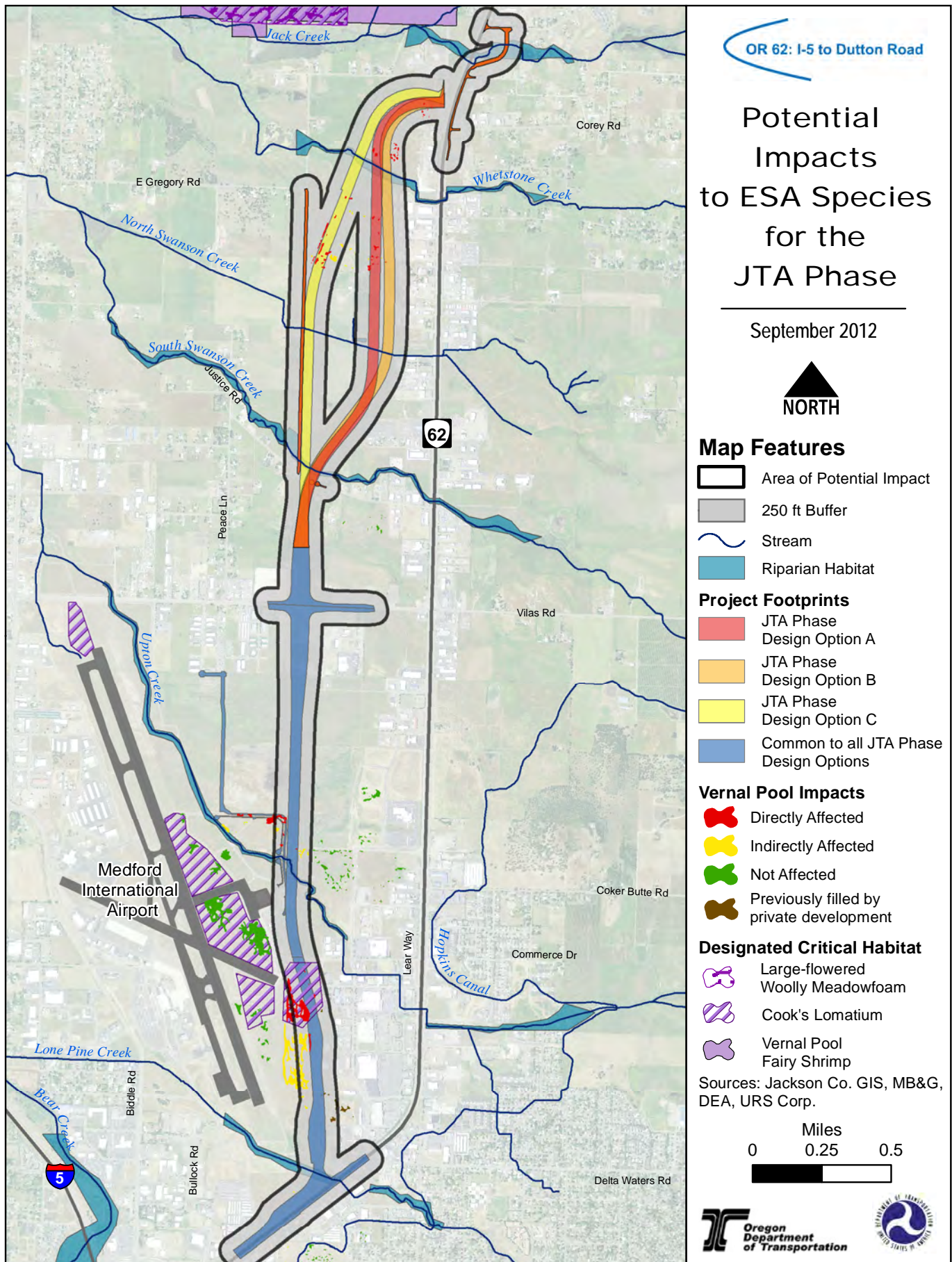
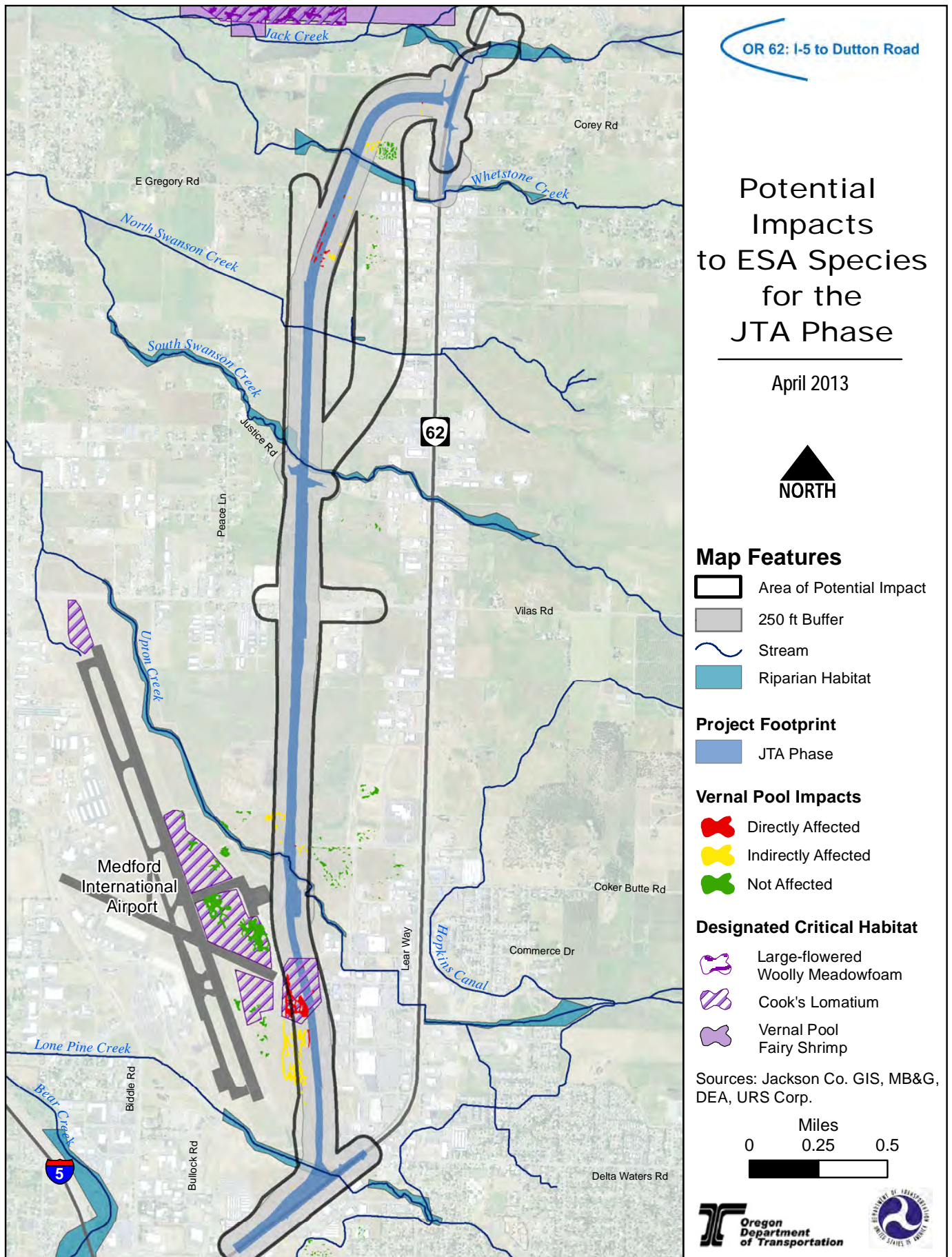


Figure 3.13-5 FEIS



Indirect Impacts

No Build Alternative

As described in Section 3.2, Land Use, build-out of the land within existing UGBs of Medford and Eagle Point and the White City UUCB would likely occur under the No Build Alternative, but plan amendments and zone changes to allow larger-scale development would be constrained. This development, although constrained, could lead to water quality and storm water runoff impacts, described in Section 3.10.3.1, which could impact fish. This development could also indirectly impact vernal pool fairy shrimp, Cook's lomatium, and large-flowered woolly meadowfoam if those species or their designated critical habitat was located near the work area.

Build Alternatives

As described in Section 3.2, Land Use, the build alternatives and JTA phase would likely accelerate land development allowed by the Medford, Eagle Point, and Jackson County comprehensive plans, including within the White City UUCB, and reduce constraints on plan amendments and zone changes to allow larger-scale development within the Medford and Eagle Point UGBs. However, the land development allowed by the comprehensive plans would also occur under the No Build Alternative. In addition, the larger-scale development (e.g., apartment complexes versus single-family subdivisions) would not necessarily result in more species displacement or loss of habitat for ESA-listed plant and wildlife species. The same species protections apply to larger-scale development that apply to smaller-scale development.

SD Alternative

Aquatic Species and Habitat

The SD Alternative would impact all streams within the project area and the aquatic species within those streams. Although all streams within the API are designated critical habitat for SONCC coho salmon, Bear Creek is the only stream crossed by the project that is known to support SONCC coho salmon within the API. With the exception of Bear Creek, due to fish passage barriers downstream of the API, SONCC coho salmon are unable to access the stream reaches within the API. These streams likely provide habitat for SONCC coho salmon in segments closer to their confluence with Bear Creek and the Rogue River. Consequently, impacts on Bear Creek would be considered to have a higher level of effect to SONCC coho salmon than impacts on other API streams. Potential indirect effects on SONCC coho salmon habitat could occur through alteration of habitat. For the analysis of indirect impacts on SONCC coho salmon habitat, habitat alteration metrics were used. The metrics and the indirect impacts associated with each metric are summarized below.

- **Habitat access and fish passage barriers.** All new and replacement stream crossings would be designed to be fish passable, so adverse impacts on habitat access and fish passage barriers are not anticipated. The SD Alternative would construct two new and one replacement crossing over Bear Creek and 12 new and up to 9 replacement crossings (with Design Option C) over the other streams within the API. All streams within the API are tributaries to the Rogue River, which supports SONCC coho salmon. If the SD Alternative is selected and constructed, some barriers to SONCC coho salmon movement within these streams would be removed, though downstream barriers would continue to prevent access to the project area.

The design refinements that have occurred since the publication of the DEIS have reduced the number of new and replacement crossings that would be included under the Preferred Alternative. The Preferred Alternative will include four fewer new stream crossings and one fewer replacement stream crossing (see Table 3.13-4).

- **Loss of riparian habitat.** Removal of trees and shrubs within the riparian zone has the potential to increase stream temperatures, which is less suitable habitat for fish, by increasing direct solar radiation to the water body. Loss of riparian habitat also reduces large woody debris recruitment and bank stability. The number of new and replacement stream crossings and acres of riparian vegetation removal are used to indicate loss of riparian habitat, as summarized in Table 3.13-4. The SD Alternative would remove 0.6 acre of riparian vegetation in Bear Creek and as little as 2.9 acres with Design Option C or up to 3.1 acres with Design Option B of riparian vegetation in other streams within the API to construct new and replacement bridges and culverts.

The design refinements that have occurred since the publication of the DEIS have resulted in the avoidance of 0.7 acres of riparian habitat. The total riparian habitat losses under the Preferred Alternative will be 2.8 acres (see Table 3.13-4).

- **Water quality impairment.** Potential water quality impacts on streams in the API are described in Section 3.10. Water quality impacts, in particular untreated storm water, can impair fish health and their habitat. Dissolved metals, particularly copper, can cause non-reversible effects to SONCC coho salmon including impairing their ability to smell and return to their spawning streams. Impervious surface acreage is used to quantify impacts from storm water on water quality. The SD Alternative would construct 14.1 acres of net new impervious surface in the Bear Creek watershed. In all other API watersheds, the SD alternative would construct 92.4 acres with Design Option B to 94.5 acres with Design Option C of net new impervious surface. As mentioned in Section 3.10, BMPs, which would also treat some existing untreated impervious areas, would reduce water quality impacts on SONCC coho salmon.

The design refinements that have occurred since the publication of the DEIS have resulted a reduction of net new impervious surface of 13 acres with the Preferred Alternative. The Preferred Alternative will construct 95.6 acres of net new impervious surface (see Table 3.13-4).

- **Stream flow modification.** Increased storm water runoff volumes and flow rates can increase sediment transport in receiving waters and alter channel shape and hydraulics. These processes could affect stream bottoms, altering fish habitat. Impervious surface is used to quantify impacts on stream flow modification. Section 3.10 discussed storm water runoff impacts. Storm water structures would be designed to detain storm water flows to at least as low as pre-project conditions so that impacts from stream flow modification would be negligible.
- **Predator-prey interactions.** The loss of riparian habitat, increases in sedimentation and turbidity, storm water pollutants, and habitat alteration from stream flow modification could affect the amount of local prey, which could decrease the feeding success of SONCC coho salmon and could increase the success of predators that prey on salmon. The number of new and replacement crossings, net new impervious surface and acres of riparian habitat removal are indicators used to assess impacts on predator-prey interactions. As previously stated, stream flow modification impacts are expected to be minimal.

Table 3.13-4 that follows summarizes the indirect impacts on SONCC coho salmon by alternative and design option.

Table 3.13-4 Summary of Indirect Impacts on SONCC Coho Salmon by Build Alternative and Design Option

	SD Alternative			DI Alternative		
	Design Option A	Design Option B	Design Option C (Preferred Alternative)	Design Option A	Design Option B	Design Option C
Number of New Stream Crossings						
Bear Creek ¹	2	2	2	0	0	0
All Other Streams in API ²	12	12	12 8	12	12	12
Total	14	14	14 10	12	12	12
Number of Existing Stream Crossings that will be Replaced						
Bear Creek ¹	1	1	1	0	0	0
All Other Streams in API ²	8	8	9 8	8	8	9
Total	9	9	10 9	8	8	9
Acres of Net New Impervious Surface ³						
Bear Creek ¹	14.1	14.1	14.1	12.5	12.5	12.5
All Other Streams in API ²	93.7	92.4	94.5 81.5	93.6	92.3	94.4
Total	107.8	106.5	108.6 95.6	106.1	104.8	106.9
Acres of Riparian Habitat Removed ³						
Bear Creek ¹	0.6	0.6	0.6	0.0	0.0	0.0
All Other Streams in API ²	3.0	3.1	2.9 2.2	3.0	3.1	2.9
Total	3.6	3.7	3.5 2.8	3.0	3.1	2.9

Notes:

¹ Known to support SONCC coho salmon.

² Assumed to be historical SONCC coho salmon habitat.

³ Total impacts may not add up due to rounding

Source: Aquatic Resources Technical Report

Terrestrial Wildlife Species and Habitat

Indirect impacts on vernal pool fairy shrimp were assessed by calculating indirect impacts on delineated vernal pools and vernal pool fairy shrimp designated critical habitat. Indirect impacts on vernal pool fairy shrimp would result from vernal pool habitat alteration, which includes habitat fragmentation, introduction of invasive species/noxious weeds, pollution from storm water runoff, and modification to vernal pool hydrology, including changes to storm water runoff patterns that affect the shallow groundwater that influences the seasonality of vernal pools. Indirect impacts on vernal pools were calculated based on methods established in the PFC, which are described in detail in the Terrestrial Resources Technical Report. Vernal pools that would be directly impacted by a build alternative or design option are not considered to be indirectly impacted by that same alternative or design option. As shown in Table 3.13-5, the SD Alternative would indirectly impact 1.7 acres with Design Option A to 2.2 acres with Design Option B of vernal pools. The SD Alternative would indirectly impact 19.8 acres of vernal pool fairy shrimp designated critical habitat. Figures 3.13-2 through 3.13-4 show the indirect impacts on vernal pools from the SD Alternative.

Indirect impacts on vernal pool fairy shrimp are based on likely project impacts to vernal pools located within 250 feet of the project footprint, but not those falling within the actual project footprint, which were included in the direct impact calculation. Additionally, vernal pools were buffered by 100 feet to account for the upland habitat that contributes to the function of the vernal pool. Any impact to a vernal pool's 100-foot buffer is assumed to affect the vernal pool in an identical direct or indirect manner.

The design refinements that have occurred since the publication of the DEIS have resulted in a shift of some vernal pool impacts from direct impacts to indirect impacts. This, combined with the additional vernal pools newly identified since the publication of the DEIS on the Wilson property, has resulted in a net increase of 1.4 acres of vernal pools indirectly impacted under the Preferred Alternative. This is shown in Table 3.13-5 and Figures 3.13-2 FEIS and 3.13-3 FEIS. The methodology used to calculate indirect impacts to critical habitat for vernal pool fairy shrimp was modified by the USFWS in March 2013. Revised impacts to critical habitat for this species are shown in Table 3.13 5.

Table 3.13-5 Indirect Impacts¹ on Federal ESA Terrestrial Wildlife and Plant Species by Build Alternative and Design Option (Acres)

Resource Evaluated	SD Alternative			DI Alternative		
	Design Option A	Design Option B	Design Option C (Preferred Alternative)	Design Option A	Design Option B	Design Option C
Vernal Pools	1.7	2.2	2.1 3.5	1.8	2.3	2.2
Vernal Pool Fairy Shrimp Designated Critical Habitat	19.8	19.8	19.8 0.0	19.8	19.8	19.8
Cook's Lomatium Designated Critical Habitat	11.3	11.3	11.3 4.7	11.3	11.3	11.3
Large-flowered Woolly Meadowfoam Designated Critical Habitat	28.8	28.8	28.8 0.3	28.8	28.8	28.8

Notes:

¹ Indirect impacts on all three ESA species include habitat fragmentation, introduction of invasive species/noxious weeds, pollution from storm water runoff, and modification to vernal pool hydrology.

Source: Terrestrial Resources Technical Report

Plant Species and Habitat

Indirect impacts on Cook's lomatium and large-flowered woolly meadowfoam are based on acres of buffered vernal pools and designated critical habitat located within a 250 foot buffer around the project footprint. Indirect impacts on Cook's lomatium and large-flowered woolly meadowfoam would result from vernal pool habitat alteration, as previously described for vernal pool fairy shrimp. The SD Alternative would indirectly impact 11.3 acres and 28.8 acres of Cook's lomatium and large-flowered woolly meadowfoam designated critical habitat, respectively as shown in Table 3.13-5.

The methodology used to calculate indirect impacts to critical habitat for Cook's lomatium and large-flowered woolly meadowfoam was modified by the USFWS in March 2013. Revised impacts to critical habitat for these species are shown in Table 3.13-5

DI Alternative

Aquatic Species and Habitat

The DI Alternative would have many of the same indirect impacts as the SD Alternative, but some key differences exist:

- **Habitat access and fish passage barriers** – The DI Alternative would not cross Bear Creek. However, for all other API streams, the DI Alternative would construct the same number of new and replacement stream crossings as the SD Alternative (Table 3.13-4). All new and replacement stream crossings would be constructed to be fish passable.
- **Loss of Riparian Habitat** – The DI Alternative would not remove any Bear Creek riparian habitat. It would remove the same amount of riparian habitat as the SD Alternative for all other API streams.
- **Water quality impairment** – Water quality impairment impacts are quantified by impervious surface acreage. The DI Alternative would create 12.5 acres of net new impervious surface within the Bear Creek watershed (1.6 acres less than the SD Alternative) and approximately the same (within 0.1 acre) of net new impervious surface within all other API stream watersheds.
- **Stream Flow Modification** – Impacts on fish from stream flow modification are quantified by impervious surface acreage, which is quantified above for the DI Alternative.
- **Predator-prey interactions** – Impacts on predator-prey interactions are quantified by number of stream crossings, net new impervious surface acreage, and riparian habitat removal, which are all quantified above for the DI Alternative.

Terrestrial Wildlife Species and Habitat

The DI Alternative would have similar indirect impacts on vernal pools. It would indirectly impact 0.1 acre more than the SD Alternative. The DI Alternative would impact the same amount of vernal pool fairy shrimp designated critical habitat as the SD Alternative (19.8 acres). Figure 3.13-2 shows the differences in impacts between the SD and DI Alternative. Figure 3.13-3 shows the differences in indirect impacts between design options. Figure 3.13-4 shows indirect impacts in the northern portion of the project, where the build alternatives are identical and there are no design options.

The methodology used to calculate indirect impacts to vernal pool fairy shrimp designated critical habitat was modified by the USFWS in March 2013. The revised method was employed to refine impact numbers reported in the 2011 Biological Assessment submitted by FHWA to USFWS. The original methodology for calculating indirect impacts to critical habitat looked only at areas where the project boundaries overlapped the critical habitat polygons. Under the revised methodology, indirect impacts are considered only for impacts where the 250-foot project buffer overlaps delineated vernal pool complexes (delineated vernal pool basin plus the 100-foot upland buffer) that occur within critical habitat polygons. Consequently, the impact values have decreased from those reported in the DEIS. Under the revised assessment methodology, there are no anticipated indirect impacts to vernal pool fairy shrimp critical habitat from the preferred alternative. Table 3.13-5 includes the revised acreage impacts associated with the Preferred Alternative.

Plant Species and Habitat

The DI Alternative would have the same indirect impacts on Cook's lomatium and large-flowered woolly meadowfoam designated critical habitat as the SD Alternative.

The methodology used to calculate indirect impacts to critical habitat for Cook's lomatium and large-flowered woolly meadowfoam was modified by the USFWS in March 2013. Under the revised assessment methodology, indirect impacts to Cook's lomatium critical habitat decreased by 6.6 acres, to a total of 4.7 acres. Indirect impacts to large-flowered woolly meadowfoam critical habitat decreased by 28.5 acres, to a total of 0.3 acre. Impacts to individuals of the species have not changed from those reported in the DEIS. Table 3.13-5 includes the revised acreage impacts associated with the Preferred Alternative.

JTA Phase

Aquatic Species and Habitat

The JTA phase would have similar indirect impacts on SONCC coho salmon as the build alternatives, although the magnitude of impacts would be less, because the JTA phase does not include new crossings over Bear Creek or any tributaries draining to Little Butte Creek. The JTA phase would construct seven new stream crossings, regardless of JTA phase design option. JTA phase Design Options A and B would both construct three replacement crossings while JTA phase Design Option C would construct four replacement crossings. JTA phase Design Option A would construct the most net new impervious surface: 0.1 acre more than JTA phase Design Option C and 1.6 acres more than JTA phase Design Option B. 6.5 acres of new impervious surface would be constructed within the Bear Creek watershed regardless of the JTA phase design option chosen. JTA phase Design Option B would remove 1.5 acres of riparian habitat, 0.3 acre more than Design Option A and 0.4 acre more than Design Option C. No riparian vegetation would be removed at Bear Creek under the JTA phase. These impacts are summarized in Table 3.13-6.

The design refinements that have occurred since the publication of the DEIS have resulted in a reduction in the number of new and replacement stream crossings, reduction in net new impervious surface, and reduction of loss of riparian habitat with the JTA phase. The JTA phase will include three new stream crossings and three replacement stream crossings, 42.9 acres of net new impervious surface, 6.5 acres of which will be within the Bear Creek watershed, and will remove 0.7 acres of riparian habitat. These impacts are summarized in Table 3.13-6.

Table 3.13-6 Summary of Indirect Impacts on SONCC Coho Salmon by JTA Phase Design Option

	Design Option A	Design Option B	Design Option C (Preferred Alternative)
Number of New Stream Crossings			
Bear Creek ¹	0	0	0
All Other Streams in API ²	7	7	7 3
Total	7	7	7 3
Number of Existing Stream Crossings that will be Replaced			
Bear Creek ¹	0	0	0
All Other Streams in API ²	3	3	4 3
Total	3	3	4 3
Acres of Net New Impervious Surface ³			
Bear Creek ¹	6.5	6.5	6.5
All Other Streams in API ²	50.1	48.5	50.0 36.4
Total	56.6	55.0	56.5 42.9
Acres of Riparian Habitat Removed ³			
Bear Creek ¹	0	0	0
All Other Streams in API ²	1.5	1.7	1.4 0.7
Total	1.5	1.7	1.4 0.7

Notes:

¹ Known to support SONCC coho salmon.

² Assumed to be historical SONCC coho salmon habitat.

³ Total impacts may not add up due to rounding.

Source: Aquatic Resources Technical Report

Terrestrial Wildlife Species and Habitat

The JTA phase's indirect impacts on the vernal pool fairy shrimp for the design options are as follows: JTA phase Design Option B would impact the most, 0.3 acre more than JTA phase Design Option C and 0.5 acre more than JTA phase Design Option A. The JTA phase would not indirectly impact any vernal pool fairy shrimp designated critical habitat. Table 3.13-7 summarizes indirect impacts on terrestrial and plant species from the JTA phase.

The design refinements that have occurred since the publication of the DEIS have resulted in a shift of some vernal pool impacts from direct impacts to indirect impacts. This, combined with the additional vernal pools on the Wilson property that were delineated since the publication of the DEIS, has resulted in a net increase of 1.4 acres of vernal pools indirectly impacted by the JTA phase. This is shown in Table 3.13-7 and Figure 3.13-5 FEIS.

Table 3.13-7 Indirect Impacts¹ on Federal ESA Terrestrial Wildlife and Plant Species by JTA Phase Design Option (Acres)

Resource Evaluated	JTA Phase Design Option		
	Design Option A	Design Option B	Design Option C
Vernal Pools	1.3	1.8	1.5 2.9
Vernal Pool Fairy Shrimp Designated Critical Habitat	0.0	0.0	0.0
Cook's Lomatium Designated Critical Habitat	11.3	11.3	11.3 4.7
Large-flowered Woolly Meadowfoam Designated Critical Habitat	0	0	0

Notes:

¹ Indirect impacts on all three ESA species include habitat fragmentation, introduction of invasive species or noxious weeds, pollution from storm water runoff, and modification to vernal pool hydrology.

Source: Terrestrial Resources Technical Report

Plant Species and Habitat

All JTA phase design options would have the same indirect impacts of 11.3 acres on Cook's lomatium designated critical habitat. The JTA phase would not indirectly impact large-flowered woolly meadowfoam designated critical habitat.

The methodology used to calculate indirect impacts to critical habitat for Cook's lomatium and large-flowered woolly meadowfoam was modified by the USFWS in March 2013. Under the revised assessment methodology, indirect impacts to Cook's lomatium critical habitat decreased by 6.6 acres, to a total of 4.7 acres. Indirect impacts to large-flowered woolly meadowfoam critical habitat remain unchanged. Impacts to individuals of the species have not changed from those reported in the DEIS. Table 3.13-3 includes the revised acreage impacts associated with the Preferred Alternative.

Construction Impacts

No Build Alternative

There would be no construction from the No Build Alternative, so there would be no construction-related impacts on ESA species.

Build Alternatives

Impacts Specific to the SD Alternative

There are several construction-related impacts on SONCC coho salmon that would occur from near-stream construction at Bear Creek. These impacts would be unique to the SD Alternative and are described below:

Electrofishing uses electric current to stun fish so they can be netted and removed from the area.

- **Hydroacoustic Noise.** Impact pile driving construction for the proposed crossing at Bear Creek, if necessary, would create hydroacoustic noise that has the potential to disturb, harm, or potentially kill aquatic species including SONCC coho salmon. The potential impacts from hydroacoustic noise include damage to internal organs, reduction of feeding success, increase in predation, and displacement from suitable habitat to less suitable habitat. The number of individuals affected depends on site conditions and the extent, duration, and timing of pile driving.
- **Potential for Toxic Spills.** There is a potential for leaks or spills of contaminants from equipment used in proximity to Bear Creek and other project-area streams. Such spills or leaks could be toxic to SONCC coho salmon. As described in Section 3.10.3, construction activities would include BMPs that, among other things, are meant to prevent spills and leaks from construction equipment or minimize the potential effects from a spill if one occurred.
- **Fish Removal.** In-water or near-water work typically includes isolation measures to prevent fish from entering the work area. In some cases, such as the pile driving next to Bear Creek and construction of a temporary bridge in Bear Creek, electrofishing could be necessary to remove fish from the work area which could result in harassment or death to some individual fish. These potential impacts are more thoroughly described in the Biological Assessment submitted to the NMFS dated December 21, 2010.
- **Storm water.** Ground disturbance during construction could result in increased sedimentation and turbidity to Bear Creek and other API streams; however with the incorporation of erosion and sediment control BMPs described in Section 3.10.3, impacts are expected to be negligible.

Impacts Common to Both Build Alternatives and JTA Phase

Construction impacts on SONCC coho salmon common to all build alternatives and JTA phase would occur in all other streams within the API except for Bear Creek. Bear Creek is the only stream crossed by the project that is known to support SONCC coho salmon within the API. All other streams in the API are designated critical habitat for SONCC coho salmon based on historic species usage, but there is no known SONCC coho salmon usage of these streams within the API boundary. Impacts could result from potential toxic spills and storm water runoff and would be similar to those described above for the SD Alternative.

Terrestrial Wildlife Species and Habitat

Construction-related activities would occur exclusively within the proposed footprint or within other already developed areas. Storm water runoff from disturbed areas during construction could cause some impacts if stormwater were to reach vernal pools. These impacts could include degradation of vernal pool habitat due to pollutants in the storm water and altered hydrology. Measures would be taken as part of construction storm water permit compliance to protect vernal pools from receiving storm water runoff during construction, thus reducing the potential for this type of impact to occur.

Plant Species and Habitat

There would be no additional impacts on Cook's lomatium or large-flowered woolly meadowfoam due to construction activities.

Federal ESA Consultation Process

Based on the impacts discussed above, FHWA found that the project "may affect, (and is) likely to adversely affect" SONCC coho salmon, vernal pool fairy shrimp, Cook's lomatium, and large-flowered woolly meadowfoam. A Biological Assessment (BA) was prepared for the aquatic species for review by NMFS, submitted on December 21, 2010, and for the terrestrial species to USFWS, submitted on December 22, 2011, in support of consultation with these agencies and to satisfy compliance with the federal ESA. The Biological Opinions (BOs) from both NMFS and USFWS will contain non-discretionary terms and conditions and recommended conservation measures. These BOs will be issued prior to the availability of the Final EIS. Cover letters which transmitted the BAs to USFWS and NMFS are included in Appendix G of this EIS.

NMFS issued its BO for the OR 62: I-5 to Dutton Road project March 20, 2013 (NMFS Highway 62 BO). The USFWS issued its BO for the project March 14, 2013 (USFWS Highway 62 BO). Both BOs are included in Appendix G.

3.13.3.2 State ESA

In addition to federal consultation, coordination with ODFW and ODA is also required.

Fish passage plans must be submitted to and approved by ODFW following sufficient design engineering of stream crossings, likely prior to the FEIS. ODFW is a member of CETAS and has been informed of project impacts on state and federal ESA species throughout the project planning process. Local ODFW biologists, including the ODFW-ODOT liaison, have been contacted during the project environmental evaluation process for assistance with local species information. All new and replacement stream crossings would be made fish passable and would comply with the Oregon Fish Passage Law. Fish passage plans would be submitted to ODFW for approval if one of the build alternatives is selected.

Fish passage plans have been submitted and approved by ODFW for the first portion of the JTA phase (for Lone Pine Creek and Upton Creek). Fish passage plans for the remaining creeks will be submitted to ODFW for approval during final design for those portions of the JTA phase.

Consultation with ODA is required for state-listed plants. To satisfy ODA consultation, Oregon Biodiversity Information Center (ORBIC) databases were queried for species occurrence records within a one-mile radius of the project area and species habitat assessments and rare plant surveys were conducted by ODOT staff, or their consultants, throughout much of the project area. Measures to avoid and minimize project impacts on listed species, established through the federal ESA Section 7 consultation, are assumed to be consistent with established state conservation programs.

3.13.4 Avoidance, Minimization, and/or Mitigation Measures

3.13.4.1 Aquatic Species and Habitat

Mitigation measures for aquatic species and habitat would be generally the same for all build alternatives and design options. However, as discussed previously, the SD Alternative would cause more impacts to aquatic species and habitat due to the added crossing of Bear Creek, so the extent of mitigation would be greater under the SD Alternative.

3.13.4.2 Riparian Habitat

Mitigation measures would be used to off-set permanent removal of 2.9 to 3.7 acres of riparian habitat under the build alternatives. ODOT contributed funds for a riparian restoration project that began in 2010 along the main stem of Little Butte Creek. The Little Butte Creek restoration project will improve approximately 6 acres of riparian habitat by removing invasive species, planting native vegetation along the creek, and installing fencing to preclude cattle from the riparian zone. If the preferred alternative would remove more than 6 acres of riparian habitat, additional mitigation measures would be implemented to offset those impacts.

3.13.4.3 In-Stream or Near-Stream Work

The following measures would be incorporated into project construction to avoid or minimize impacts from in-stream work under the build alternatives:

- **In-water Work Window.** In-stream work would only occur during the ODFW approved in-water work window of June 15 through September 15, unless expressly authorized by ODFW and NMFS. This period occurs during the seasonal lull between migratory fish runs, resulting in a lower probability of affecting protected fish species.
- **Regulated Work Areas.** All in-stream areas would be established as regulated work areas. All vehicles and equipment would be prohibited from entering regulated work areas without the prior authorization of the Project Manager.

- **Work Area Isolation.** The work area would be isolated from the active stream flow, both upstream and downstream of the work area, using temporary water management facilities, unless otherwise approved in writing by appropriate regulatory agencies through the Project Manager. Safe passage around or through the in-water work area must be provided for adult and juvenile native migratory fish, unless passage did not previously exist, or as otherwise approved in writing by appropriate regulatory agencies through the Project Manager.
- **Fish Removal/Fish Salvage.** Access would be provided to ODOT, ODFW, and qualified and permitted consultant personnel for access to the regulated work area to remove fish trapped within the isolated work areas, as directed.
- **Water Diversion.** If pumps would be used, operate the pumps as needed up to 24-hours a day during the diversion to prevent de-watering the stream downstream of the diversion. A back-up pump would be kept available in the event of failure of the primary pump. All pumps would be screened to prevent the entrainment of fish, according to ODFW and NMFS screening criteria.
- **Waste Containment.** Work on over-water structures would provide full containment to prevent construction materials and waste from entering the aquatic environment.
- **Manage Turbidity Levels.** Turbidity levels would be managed in waters of the state or U.S. Levels would not exceed 10 percent above background reading (taken approximately 100 feet upstream of the project), as measured approximately 100 feet downstream of the project.
- **Site Restoration.** Stream banks would be restored to natural slope, pattern, and profile suitable for establishment of permanent woody vegetation where possible. Disturbed slopes will be replanted with appropriate, native, riparian species, in compliance with an approved site restoration plan.

3.13.4.4 Terrestrial Wildlife Species and Habitat

The following impact avoidance, minimization and mitigation measures would be employed for vernal pool fairy shrimp under the build alternatives.

- Clearly identify all vernal pools in the field prior to construction. Establish exclusion zones with construction fencing around vernal pools to be preserved to restrict equipment encroachment during construction.
- Evaluate potential to transplant vernal pool fairy shrimp eggs from impacted vernal pools to vernal pools at off-site mitigation location.
- Mitigate off-site for direct and indirect impacts on vernal pools in compliance with the PFC.

The off-site mitigation for JTA phase direct and indirect impacts on vernal pool fairy shrimp will take place at the KPMS described in Section 3.12.4.1, in compliance with the March 14, 2013, USFWS Highway 62 BO referenced in Section 3.13.3.1. ODOT also plans to mitigate for the impacts on vernal pool fairy shrimp of project phases subsequent to the JTA phase at the KPMS. Section 3.12.4.1 describes ODOT's plans for the KPMS and the impacts vernal pool restoration and preservation will have on vernal pools and other wetlands at the site.

3.13.4.5 Plant Species and Habitat

The following impact avoidance, minimization and mitigation measures would be employed for Cook's lomatium and large-flowered woolly meadowfoam under the build alternatives.

- Establish exclusion zones around ESA plant populations and suitable habitat to be preserved with construction fencing to restrict equipment encroachment during construction.
- Following construction of the project, establish ODOT Special Management Areas within the new right-of-way to protect listed plant populations from routine ODOT maintenance practices.
- Transplant (or harvest seeds from) directly or indirectly impacted plants to the off-site mitigation location.

- During initial clearing and grubbing activities, remove topsoil (seedbank) from the impacted area and stockpile for restoration purposes. Replace this topsoil post-construction (spread to original thickness), where appropriate and feasible. To the extent practicable, within the ODOT right-of-way, outside of the roadway facility, retain the undisturbed portion of the Cook's lomatium population to preserve the genetic variability of this southern-most population.
- Establish off-site mitigation areas for Cook's lomatium and large-flowered woolly meadowfoam to areas of Agate-Winlo Complex soils.
- Transplant impacted plant populations during their dormant periods (August-December), where feasible.
- To the greatest extent practicable, within ODOT right-of-way, outside of the roadway facility, preserve suitable habitat in areas that would not be developed or disturbed.
- Incorporate long-term monitoring at ODOT's vernal pool mitigation site that advances knowledge about Cook's lomatium and large-flowered woolly meadowfoam as recommended in the USFWS Draft Recovery Plan for Wet Prairie Species (USFWS 2006).

Implementation of the above measures could minimize the project's overall impacts on ESA plant populations within the proposed footprint. Although the selection of a build alternative could result in permanent losses to ESA plants, the above activities could compensate for a portion of the overall losses.

As with project impacts on vernal pools and vernal pool fairy shrimp, ODOT will mitigate for project impacts on Cook's lomatium and large-flowered woolly meadowfoam at the KPMS site described in Section 3.12.4.1.

3.13.5 Avoidance, Minimization, and/or Mitigation Commitments Incorporated into the Preferred Alternative

ODOT makes the following commitments.

JTA Phase

ODOT will mitigate off-site for all 1.4 acres of direct impacts on vernal pools and 2.9 acres of indirect impacts on vernal pools anticipated from the JTA phase in accordance with the March 14, 2013, USFWS Highway 62 BO referenced in Section 3.13.3.1.

ODOT is developing the 116-acre KPMS, described in 3.12.4, to provide off-site mitigation for project impacts to vernal pool-associated ESA species, including vernal pool fairy shrimp, Cook's lomatium, and large-flowered woolly meadowfoam. The March 14, 2013, USFWS Highway 62 BO applies mitigation ratios for impacts on vernal pool habitat that were developed in accordance with the Programmatic Formal Consultation on the U.S. Fish and Wildlife Service's Vernal Pool Conservation Strategy for Jackson County, Oregon (PFC)(USFWS 2011) and in accordance with state and federal regulations administered by the Corps and DSL.

Based on these mitigation ratios, ODOT will use 8.6 mitigation credits at the KPMS to mitigate for the 4.3 acres of vernal pools impacted by the JTA phase. This is a mitigation ratio of one mitigation credit per 0.5-acre of vernal pool impact.

The KPMS is expected to yield approximately 30 mitigation credits, where one mitigation credit can mitigate for up to one acre of direct or indirect vernal pool impacts. Consequently, the 30 mitigation credits will be more than sufficient to mitigate for the anticipated vernal pool impacts from the JTA phase, as well as the wetland impacts addressed in Section 3.12.5.1. Mitigation credits in excess of those needed for the JTA phase will be retained for subsequent phases of the OR 62: I-5 to Dutton Road project.

JTA Phase and Preferred Alternative Subsequent to Construction of the JTA Phase

Aquatic Species and Habitat

- ODOT has mitigated for anticipated riparian habitat impacts, per the ODFW Habitat Mitigation Policy, through advanced mitigation coordinated by the Oregon Watershed Enhancement Board. ODOT contributed \$10,000 for a riparian restoration project along the mainstem of Little Butte Creek. The project provided approximately six acres (approximately 3,300 lineal feet) of riparian habitat mitigation, which exceeds the estimated 3.5 acres of riparian impacts from the Preferred Alternative. This project began in 2010 and included removing invasive species, planting native vegetation along the creek, and installing fencing to preclude cattle from entering the riparian zone.
- ODOT will only conduct in-stream work during the ODFW approved in-water work window of June 15 through September 15, unless expressly authorized by ODFW and NMFS.
- ODOT will establish all in-stream work areas as regulated work areas. All vehicles and equipment will be prohibited from entering regulated work areas without the prior authorization of the Project Manager.
- ODOT will isolate all in-stream or near-stream work areas from the active stream flow, both upstream and downstream of the work area, using temporary water management facilities unless otherwise approved in writing by appropriate regulatory agencies through the Project Manager.
- ODOT will provide access to regulated in-stream work areas to ODOT, ODFW, and qualified and permitted consultant personnel to remove fish trapped within the isolated work areas, as directed.
- If pumps are used for water diversion, ODOT will operate the pumps as needed up to 24 hours a day during the diversion to prevent de-watering the stream downstream of the diversion. A back-up pump will be kept available in the event of failure of the primary pump. All pumps will be screened to prevent the entrapment of fish, according to ODFW/NMFS screening criteria.
- ODOT will provide full containment to prevent construction materials and waste from entering the aquatic environment for work on over-water structures.
- ODOT will manage turbidity levels in waters of the state or U.S. in accordance with ODOT Technical Services Bulletin GE-09-03(B).
- ODOT will restore stream banks to natural slope, pattern, and profile suitable for establishment of permanent woody vegetation where practical.
- ODOT will replant disturbed slopes with appropriate, native, riparian species, in compliance with an approved site restoration plan.

Terrestrial Wildlife Species and Habitat

- ODOT will secure Corps and DSL permits to allow the necessary permanent filling and temporary disturbance of vernal pools. ODOT will work with the agencies to develop adequate vernal pool protection and mitigation measures.
- ODOT will develop a project-specific, on-site restoration plan to address temporarily-impacted vernal pool complex habitat within construction areas. Monitoring of site restoration and mitigation activities will comply with ODOT policies and established regulatory agency requirements. Monitoring of site restoration areas will be detailed in the plan, including annual reporting requirements, native species mix compliance, and noxious weed control requirements.
- ODOT will monitor construction activities to minimize impacts to listed species and their habitat within the regulated work area. ODOT will identify all vernal pool complexes in the field prior to construction, establish fenced exclusion zones around vernal pool complexes to be preserved to prevent equipment encroachment during construction, prohibit the discharge of pollutants of any kind into wetlands and vernal pool complexes, and prohibit the disposal of construction debris or rubble from the demolition of existing structures within any vernal pools.
- ODOT will time construction within and adjacent to vernal pools during the dry season of the year from July to November, corresponding to the dormant period for vernal pool fairy shrimp.

-
- At the KPMS site referenced in the first bullet item under JTA phase mitigation commitments above, ODOT will:
 - incorporate applicable BMPs prescribed in the PFC into a vernal pool complex mitigation plan for the site;
 - prohibit off-road driving at the site and implement an aggressive integrated pest management program for noxious weeds control;
 - develop a comprehensive monitoring and reporting program for actions taken at the site, in compliance with its mitigation/conservation bank annual reporting obligations to the Corps and USFWS. Monitoring will comply with ODOT policies and specifications and use standard templates and will be submitted to regulatory agencies following established procedures.
 - ODOT will establish exclusion zones around ESA plant populations and suitable habitat to be preserved with construction fencing to restrict equipment encroachment during construction.

Plant Species and Habitat

- To the extent practicable, ODOT will retain the undisturbed portion of the Cook's lomatium population to preserve the genetic variability of this southern-most population, by removing the topsoil (seedbank) from the impacted area and stockpile for restoration purposes during initial clearing and grubbing activities. ODOT will replace this topsoil post-construction (spread to original thickness), where appropriate and feasible within the ODOT right-of-way, outside of the roadway facility.
- ODOT will establish a population of 3,400 Cook's lomatium and 200 large-flowered woolly meadowfoam at the KPMS site to supplement the existing population or establish a new population. ODOT will do this by propagating seeds from, or planting cuttings from, Cook's lomatium and large-flowered woolly meadowfoam obtained from project areas where temporary impacts will occur.
- ODOT will incorporate long-term monitoring at the KPMS that advances knowledge about Cook's lomatium and large-flowered woolly meadowfoam, as recommended in the USFWS Draft Recovery Plan for Wet Prairie Species (USFWS 2006).
- ODOT will nominate remaining ESA-listed plant populations within the new right-of-way where practicable for Special Management Area status to manage suitable listed plant populations following construction. ODOT will establish fenced exclusion zones around rare plant populations and suitable habitat to be preserved to prevent equipment encroachment during construction.

Preferred Alternative Subsequent to Construction of the JTA Phase

Impacts to vernal pool-associated ESA species resulting from future phases of the OR 62: I-5 to Dutton Road Project will be mitigated per the ratios and amounts stipulated in the March 26, 2013, USFWS Highway 62 BO or PFC, whichever are greater. ODOT plans to mitigate for the vernal pool impacts of phases of the Preferred Alternative subsequent to the JTA phase using credits from the KPMS that remain after mitigation of impacts of the JTA phase. Should more mitigation credits be needed than are available from the KPMS, ODOT will have the option to purchase mitigation credits from the Wildlands vernal pool mitigation bank or use forthcoming mitigation credit releases from ODOT's existing vernal pool mitigation bank.

Subsequent phases of the Preferred Alternative are estimated to impact an additional 4.3 acres of direct and indirect impacts to vernal pool habitats, requiring an estimated 9.8 mitigation credits. This is a ratio of one mitigation credit per 0.44-acre of vernal pool impacted. This ratio is higher than the mitigation ratio for the JTA phase because the vernal pools impacted by the subsequent phases are higher in quality than the vernal pools impacted by the JTA phase. The USFWS reserves the option to revise the PFC, which could require higher a mitigation ratio for future project phases.

3.14

Section 3.14 Content

- 3.14.1 Regulatory Setting
- 3.14.2 Affected Environment
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3.14 Non-Threatened and Endangered Species

3.14.1 Regulatory Setting

This subsection discusses existing conditions, potential impacts, and permit requirements associated with wildlife that are not listed under the state or federal ESA. This section analyzes impacts on species and habitats based on site specific information. Federal laws and regulations beyond the ESA that pertain to fish and wildlife and are applicable to this project include:

- **Migratory Bird Treaty Act.** This Act makes it unlawful to take, import, export, possess, sell, purchase, or barter any migratory bird, with the exception of the taking of game birds during established hunting seasons. The law also applies to feathers, eggs, nests, and products made from migratory birds. This law is of particular concern when birds nest on bridges, buildings, signs, illumination, and ferry dock structures.
- **Bald and Golden Eagle Protection Act.** This Act makes it unlawful to take, import, export, sell, purchase, or barter any bald or golden eagle, their parts, products, nests, or eggs. "Take" includes pursuing, shooting, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbing the eagles.
- **Magnuson-Stevens Act (Fishery Conservation and Management Act).** This Act emphasizes the sustainability of the nation's fisheries and created a new habitat conservation approach. This habitat is called Essential Fish Habitat (EFH).

State laws and regulations beyond the ESA that pertain to fish and wildlife include, but are not limited to, the following:

ORS Chapter 496 of the Oregon Wildlife Code

- **Fish Passage.** The owner or operator of an artificial obstruction located in waters in which native migratory fish are currently or were historically present must address fish passage requirements prior to certain trigger events (installation, major replacement, a fundamental change in permit status [e.g., new water right, renewed hydroelectric license], or abandonment of the artificial obstruction). Laws regarding fish passage may be found in ORS 509.580 through 910 and in OAR 635, Division 412.

In addition to state and federal regulations, Jackson County regulates development within riparian areas. Jackson County requires that structures and grading be kept at least 50 feet away from streams that provide habitat, such as Bear Creek.

For further information regarding ESA species, including citations to source documents, refer to the *OR 62 Corridor Solutions Project Terrestrial Resources Technical Report*, November 2011 and the *OR 62 Corridor Solutions Project Aquatic Resources Technical Report*, July 2011. These reports are available from the ODOT contact person identified on page i of this EIS

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3.14.2 Affected Environment

The API is defined as the project footprint with a 250 foot buffer on all sides as shown in Figure 3.14-1. Six dominant habitat types were identified within the API: developed, grassland, wetlands, mound/vernal pool, riparian, and aquatic. These habitat types are different from those discussed in Section 3.11, because these habitat types are based on a site-specific investigation and include the entire API, not just areas within the ODFW Conservation Opportunity Areas (COAs). These habitat types are known to support specific plant and wildlife species. The habitat types and species that are known to occur within each habitat type are described in further detail below. Species protected under the ESA are discussed in Section 3.13.

Special status species that are not protected under the ESA, such as federal species of concern and state sensitive species, are not evaluated specifically because there is little documentation available regarding their specific presence and there are numerous non-ESA special status species that could be present within the project vicinity. Since species of concern presence is unknown it is not possible to predict impacts on these species. The complete list of special status species, including species of concern and sensitive species, is available in Appendix H.

3.14.2.1 Developed Habitat

Developed habitat is developed land that consists of commercial, residential, and industrial development. It is the most common habitat type in the API, though it is concentrated along existing OR 62. These areas support little or no vegetation, except for small areas landscaped primarily with non-native plants. The developed habitat includes extensive areas of impervious surfaces. Some residential areas in the vicinity of East Vilas Road contain fields and lawns dominated by non-native grasses such as Kentucky bluegrass and timothy. Developed habitat is typically considered low quality habitat. However, some developed areas provide ecological value to local wildlife such as food and shelter. Common landscaping trees and shrubs that produce berries, such as cherry, western juniper, and mountain ash, provide food sources for wildlife. Animals such as raccoon, opossum, deer mouse, non-native house mouse, gopher snake, common garter snake, Pacific tree frog, red-tailed hawk, northern harrier, Steller's jay and a large number of songbirds, particularly swallows and chickadees, may be found in developed areas. In addition, many bats rely on residential and commercial structures for roosting and rearing sites. Wildlife species that were identified either by observation or by sign in the project area include raccoon, black-tailed jackrabbit, American robin, house finch, turkey vulture, European starling, and several gull species.

3.14.2.2 Grassland Habitat

Grasslands are the second-most prevalent habitats in the API, behind the developed habitat. Grasslands are mostly open with little to no tree or shrub cover and are composed of various native and non-native herbaceous species, but are dominated by grasses. Grassland habitat is dominated by vegetation, compared to developed habitat which is dominated by impervious surfaces and bare ground. Non-native plant species known to occur within the grassland habitat include medusa head, chicory, teasel, yellow star-thistle, Kentucky bluegrass, timothy, and red clover. Some of these species are noxious weeds which are discussed in Section 3.15. Native species include California danthonia and slender wheatgrass. Some grasslands in the API are highly degraded from heavy grazing or mowing for hay harvesting. Wildlife inhabiting these areas must be tolerant of such disturbance. Types of wildlife known to reside in these grasslands include several bird, mammal, reptile, and amphibian species. Species identified in the API by observation or sign include the black-tailed jackrabbit, coyote, meadow vole, mule deer, western meadowlark, American crow, turkey vulture, European starling, American robin, American kestrel, ring-necked pheasant, mourning dove, American goldfinch, common garter snake, and gopher snake.

3.14.2.3 Wetland Habitat

Numerous wetlands are present in the API, as described in Sections 3.11 and 3.12. These areas provide important habitat for migratory birds, waterfowl, shorebirds, waterbirds,

Figure 3.14-1

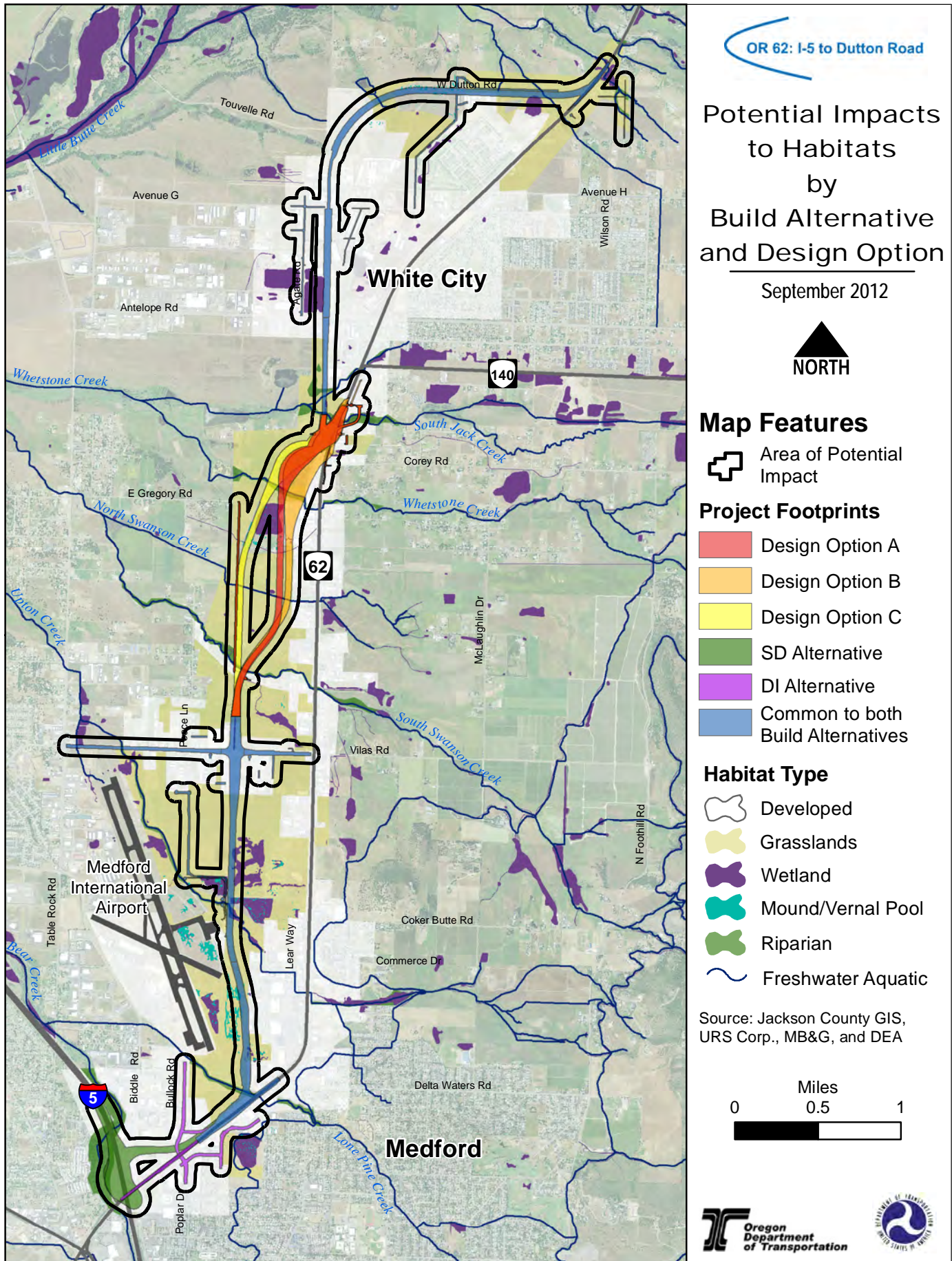
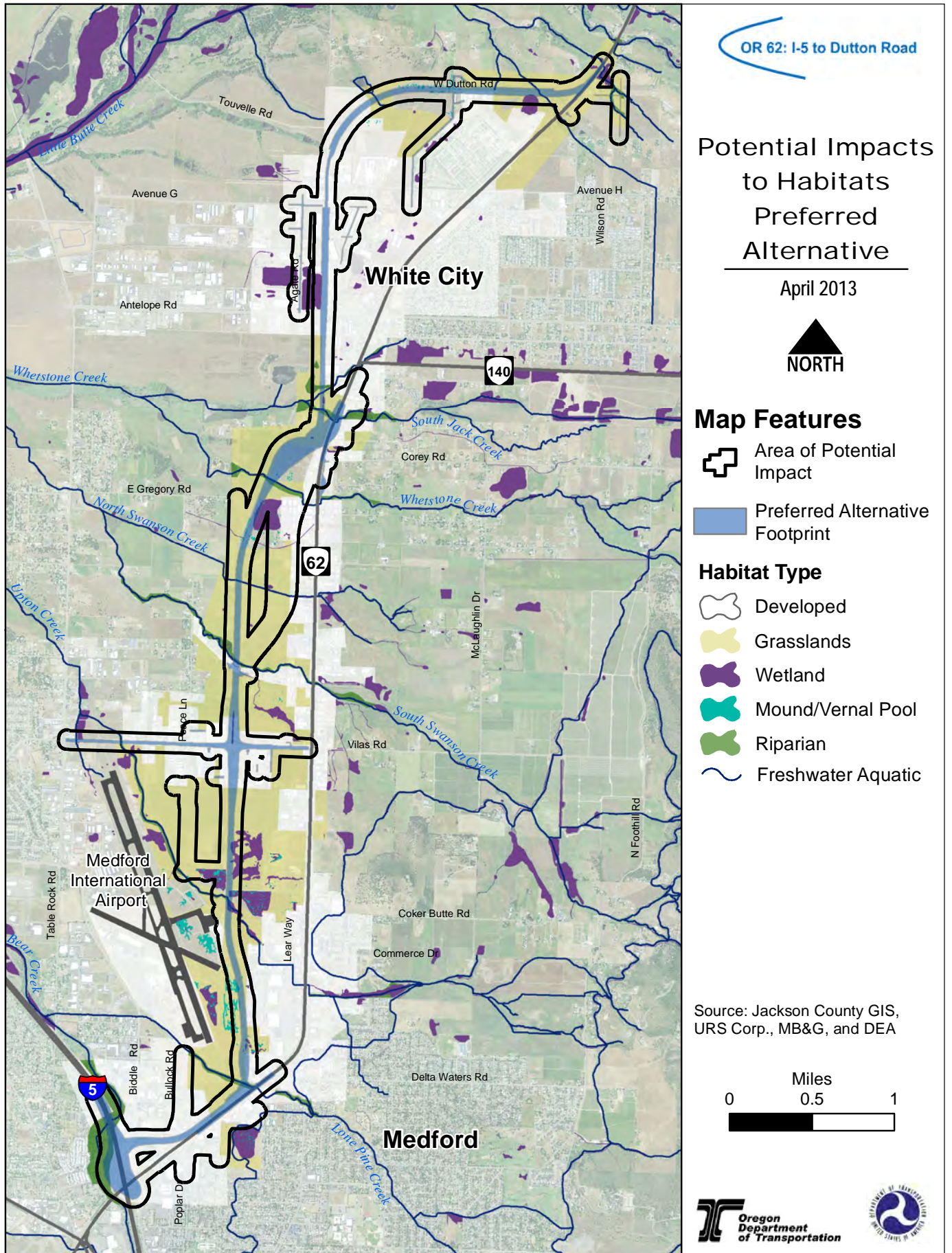


Figure 3.14-1 FEIS



songbirds, mammals, amphibians and reptiles. Additionally, some wetlands such as floodplain wetlands and swamps can provide important habitat for juvenile salmon. Specific plant species identified within the wetlands in the API include willows, Himalayan blackberry, Oregon ash, black cottonwood, and reed canary grass.

3.14.2.4 Mound/Vernal Pool Habitat

Mound/vernal pool habitat is less common in the API than other habitat types in the API. Mound/vernal habitat is different from the delineated vernal pools described in Section 3.13. Mound/vernal pool habitat encompasses a larger area that includes mounded areas in between the wet pools as well as the pools themselves, creating a larger more contiguous area. Mound/vernal pool habitat provides important and unique habitat for several plant and wildlife species, including threatened and endangered species discussed in Section 3.13. Most of this habitat type is located in the southern half of the API near the airport. All of the vernal pools within the mound/vernal pool habitat in the API have been degraded by the invasion of non-native plants, grazing, road construction and illegal trash dumping.

In addition to the ESA species discussed in Section 3.13, the following wildlife species also use mound/vernal pool habitat: western meadowlark, mourning dove, savanna sparrow, vesper sparrow, greater yellowlegs and other wintering shorebirds, red-tailed hawk, merlin, deer mouse, meadow vole and gopher snake. During the winter months, temporary ponding (inundation) provides temporary habitat for waterfowl and wintering shorebirds. During periods of vernal pool inundation, several pairs of mallards and non-native bullfrog tadpoles were observed within the API.

3.14.2.5 Riparian Habitat

Riparian habitat typically occurs in narrow bands along the majority of the perennial streams within the API, as previously described in Section 3.10. As with most of the other habitats present in the API, much of the riparian habitat has been highly altered by human activity. Riparian plant species include Himalayan blackberry, reed canarygrass, purple loosestrife, sedge, rush, cattails, and poison hemlock. Mixed stands of Pacific willow, black cottonwood, and Oregon ash also exist in several places.

Types of wildlife known to reside in riparian habitat include several bird, mammal, reptile, and amphibian species. Specific species identified in the area by observation or sign include raccoon, muskrat, mallard, belted kingfisher, Canada goose, great blue heron, common merganser, red-wing blackbird, salamanders, bullfrogs and a wide variety of insects such as dragonflies.

3.14.2.6 Freshwater Aquatic Habitat

Freshwater aquatic habitats include all streams within the API, as discussed in Section 3.9.2.1 and include the in-water habitat, but not riparian habitat. These freshwater aquatic habitats are important for fish, amphibians, and reptiles. They are also an important water source for other birds and mammals. This habitat has been affected by barriers (e.g., roads, dams, culverts) that hinder fish passage and alter the stream's natural hydrology. Freshwater aquatic habitat quality is dependent on riparian and upland vegetation for stream bank stabilization, shade, and runoff filtration. Generally, this habitat has poor water quality, as described in Section 3.10. Streams in the API provide habitat for the following non-ESA species: fall Chinook salmon, summer steelhead, winter steelhead, cutthroat trout, sunfish, mosquitofish, larval bullfrogs, and water boatman.

EFH (Essential Fish Habitat) is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.

The Magnuson-Stevens Act includes a mandate that NMFS must identify and manage Essential Fish Habitat (EFH) for federally-managed marine fish. The Pacific coast salmon fishery is managed under the Magnuson-Stevens Act. Freshwater EFH has been identified for Chinook, coho, and chum salmon species. Within the project API, EFH has been defined for the SONCC coho ESU and the Southern Oregon Coastal/Northern California Coastal ESU of Chinook salmon. Bear, Lone Pine, Upton, Swanson, Whetstone, and Jack creeks, and several unnamed tributaries to Little Butte Creek are considered freshwater EFH areas for Pacific salmon, as they were all likely historically accessible to salmon. These streams coincide with streams identified as designated critical habitat for SONCC coho salmon described in Section 3.13. Impacts on EFH would be the same as impacts on SONCC coho salmon designated critical habitat described in Section 3.13.

3.14.3 Environmental Consequences

3.14.3.1 Direct Impacts

No Build Alternative

The No Build Alternative would not cause the loss of any of the six habitats in the API.

Build Alternatives

Both build alternatives would have the same types of impacts on species displacement, habitat loss and fragmentation, and migration path disruption, although the number of acres affected would differ. Species displacement is assumed to be directly proportional to habitat loss, since actual species populations and locations are unknown. Impacts from both build alternatives are discussed below.

Habitat Displacement

Developed habitats would be impacted the most under both build alternatives with loss of 142.0 to 182.8 acres as indicated in Table 3.14-1. The SD Alternative would remove approximately 23 more acres of developed habitat than the DI Alternative. Grassland habitat would be the second-most impacted habitat type with 133.1 to 138.5 acres displaced. The DI Alternative would remove approximately 2 acres more grassland habitat than the SD Alternative. The SD Alternative would displace approximately 0.5 acres more wetland and 0.6 acres more riparian habitat than the DI Alternative. Whichever alternative is selected would comply with Jackson County and City of Medford regulations for development in riparian areas.

The design refinements that have occurred since the publication of the DEIS have resulted in an approximately 12.1 acre reduction in habitat loss with the Preferred Alternative. Table 3.14-1 summarizes the impacts to habitats under the Preferred Alternative.

Table 3.14-1 Plant and Wildlife Habitat Loss by Alternative and Design Option (Acres)

Habitat Type	SD Alternative			DI Alternative		
	Design Option A	Design Option B	Design Option C (Preferred Alternative)	Design Option A	Design Option B	Design Option C
Developed	165.6	182.8	165.0 165.8	142.6	159.8	142.0
Grassland	133.1	136.5	135.6 125.1	135.1	138.5	137.6
Wetland	22.1	20.3	23.3 21.9	21.6	19.8	22.8
Mound/Vernal Pool ¹	38.9	36.0	40.8 40.5	38.9	36.0	40.8
Riparian	3.6	3.7	3.5 2.8	3.0	3.1	2.9
Total	363.3	379.3	368.2 356.1	341.2	357.2	346.1

Notes:

¹ Acres of mound/vernal pool habitat impacts don't match with the acreages of vernal pool impacts shown in Section 3.13, because the impacts in Section 3.13 were calculated specifically for impacts on delineated vernal pools following more conservative USFWS methods. This section shows impacts on the broader mound/vernal pool habitat.

Source: Terrestrial Resources Technical Report

Both build alternatives would displace the same amount of mound/vernal pool habitat. Design Option B would impact more developed, grassland, and riparian habitat than Design Option A or C. Design Option C would impact more wetland and mound/vernal pool habitat than the other two design options. Figure 3.14-1 shows habitat impacts for the build alternatives and design options.

Habitat Fragmentation and Migration Path Disruption

Impacts on habitat fragmentation and migration path disruption would generally occur in undeveloped, non-urban areas. The API is generally within urban areas where habitat fragmentation and migration path disruption has already occurred. However, as mentioned in Section 3.11.1.2, according to ODFW, there are wildlife linkages of medium value in the API that are depicted in Figure 3.11-3. Construction of either build alternative would have additional impacts on habitat fragmentation and migration path disruption, and would be the same for either alternative. As discussed in Section 3.11.2.1, impacts to wildlife migration could make it more difficult for wildlife to obtain food, shelter, and access mates. Impacts on habitat fragmentation and migration path disruption would differ based on the design option chosen.

Design Option C would cause more habitat fragmentation than Design Option A or B because it would be constructed on a large, undeveloped grassland area. Design Options A and B would be constructed closer to existing urban areas and existing OR 62 where the habitat would likely be lower quality. Design Option B would cause a larger impact to wildlife migration because it is closest to existing OR 62 and nearby urban areas. Design Option B, in addition to existing OR 62, would create two parallel high volume roadways that would be more difficult for wildlife to cross than only crossing existing OR 62. Design Options A and C would leave larger undeveloped tracts of land in between roadways, potentially making it easier for wildlife to migrate. However the project area has not been identified as a high value migratory corridor.

JTA Phase

JTA phase Design Option B would impact more developed and riparian habitat types than the other two design options. JTA phase Design Option C would impact the most grassland habitat: 0.7 acres more than JTA phase Design Option B and 1.4 acres more than JTA phase Design Option A. JTA phase Design Option A would replace the most mound/vernal pool habitat: 2.0 more acres than JTA phase Design Option C, and 6.0 more acres than JTA phase Design Option B. JTA phase Design Option C would cause more habitat fragmentation than the other JTA phase design options and JTA phase Design Option B would cause the largest impact to wildlife migration. Table 3.14-2 summarizes habitat impacts from the JTA phase and Figure 3.14-2 shows potential habitat impacts from the JTA phase.

The design refinements that have occurred since the publication of the DEIS have resulted in an approximately 16.4 acre reduction in habitat loss with the JTA phase. Table 3.14-2 summarizes the impacts to habitats under the JTA phase.

Table 3.14-2 Plant and Wildlife Habitat Loss for the JTA Phase (Acres)

Habitat Type	Design Option		
	Design Option A	Design Option B	Design Option C (Preferred Alternative)
Developed	49.0	54.0	47.3 43.8
Grassland	82.8	83.5	84.2 73.7
Wetland	13.0	11.8	14.3 12.9
Mound/Vernal Pool	13.6	7.6	11.6 11.3
Riparian	1.5	1.7	1.4 0.7
Total	159.9	158.6	158.8 142.4

Source: Terrestrial Resources Technical Report

3.14.3.2 Indirect Impacts

No Build Alternative

As described in Section 3.2, Land Use, build-out of the land within existing UGBs of Medford and Eagle Point and the White City UUCB would likely occur under the No Build Alternative, but plan amendments and zone changes to allow larger-scale development would be constrained. This development, although constrained, could cause plant and wildlife habitat loss.

Build Alternatives and JTA Phase

As described in Section 3.2, Land Use, the build alternatives and JTA phase could accelerate land development allowed by the Medford, Eagle Point, and Jackson County comprehensive plans, including within the White City UUCB, and reduce constraints on plan amendments and zone changes to allow larger-scale development within the Medford and Eagle Point UGBs. However such larger-scale development would not necessarily result in more plant and wildlife habitat displacement than the No Build Alternative, and could result in less. Indirect impacts on non-ESA freshwater aquatic species and their habitat would be the same as described for ESA aquatic species in Section 3.13, which includes loss of riparian habitat, water quality impairments, stream flow modification, and predator-prey interactions.

3.14.3.3 Construction Impacts

No Build Alternative

Under the No Build Alternative, there would be no construction-related impacts on non-ESA species.

Build Alternatives and JTA Phase

Project construction, including staging areas, is expected to stay within the project footprint or within other already developed areas. Construction activities would also cause habitat displacement, fragmentation, and disrupt wildlife migration. Storm water runoff from developed areas during construction could cause impacts on mound/vernal pool habitat and/or wetlands. Measures would be taken as part of construction storm water permit compliance to protect mound/vernal pool and wetland habitat from receiving storm water runoff during construction. Construction impacts on freshwater aquatic habitat could occur from in-stream or near stream construction, as described in Section 3.13.3.1, and could include hydroacoustic noise, toxic spills, fish removal, and storm water runoff.

3.14.4 Avoidance, Minimization, and/or Mitigation Measures

Avoidance, minimization, and mitigation measures for plant and wildlife habitats would be the same as those described in Section 3.13.. Measures for wetlands are described in Section 3.12.

The project would be designed with fish passable culverts to avoid fish passage impacts and with approved fish passage plans that meet Oregon's fish passage requirements in ORS 590.580-590.910 and OAR 635, Division 412. These crossings could also provide safe wildlife passage for other small wildlife species. Additionally, conformance with the Migratory Bird Treaty Act, through consistency with ODOT Highway Division Directive ENV01-01, January 17, 2006, found at: http://www.oregon.gov/ODOT/HWY/PDU/docs/pdf/ENV_01_01.pdf?ga=t, would minimize impacts on migratory birds. Mitigation measures discussed in Section 3.13.4.1 for aquatic ESA species would also mitigate for impacts on EFH designated by the Magnuson-Stevens Act.

Figure 3.14-2

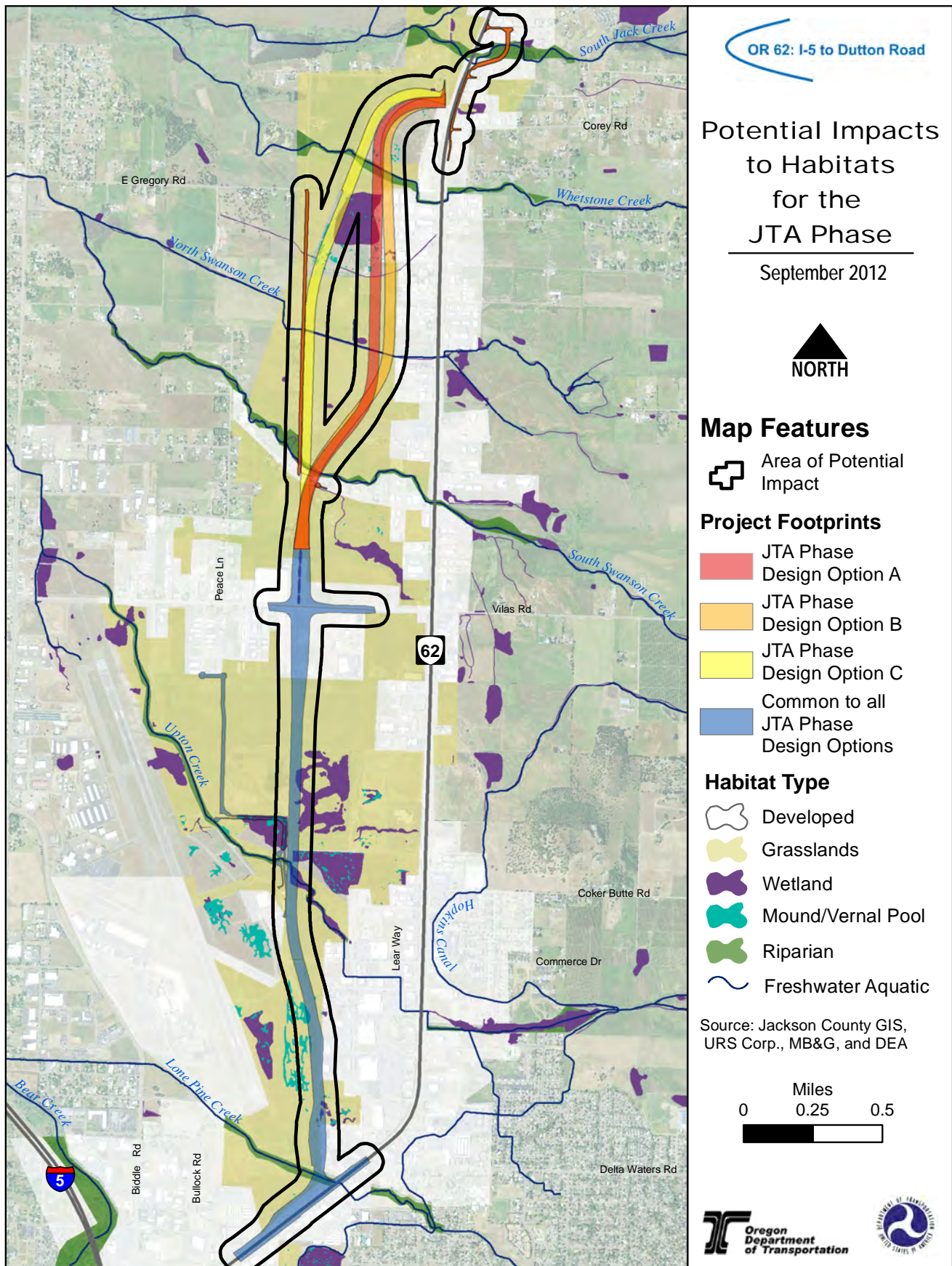
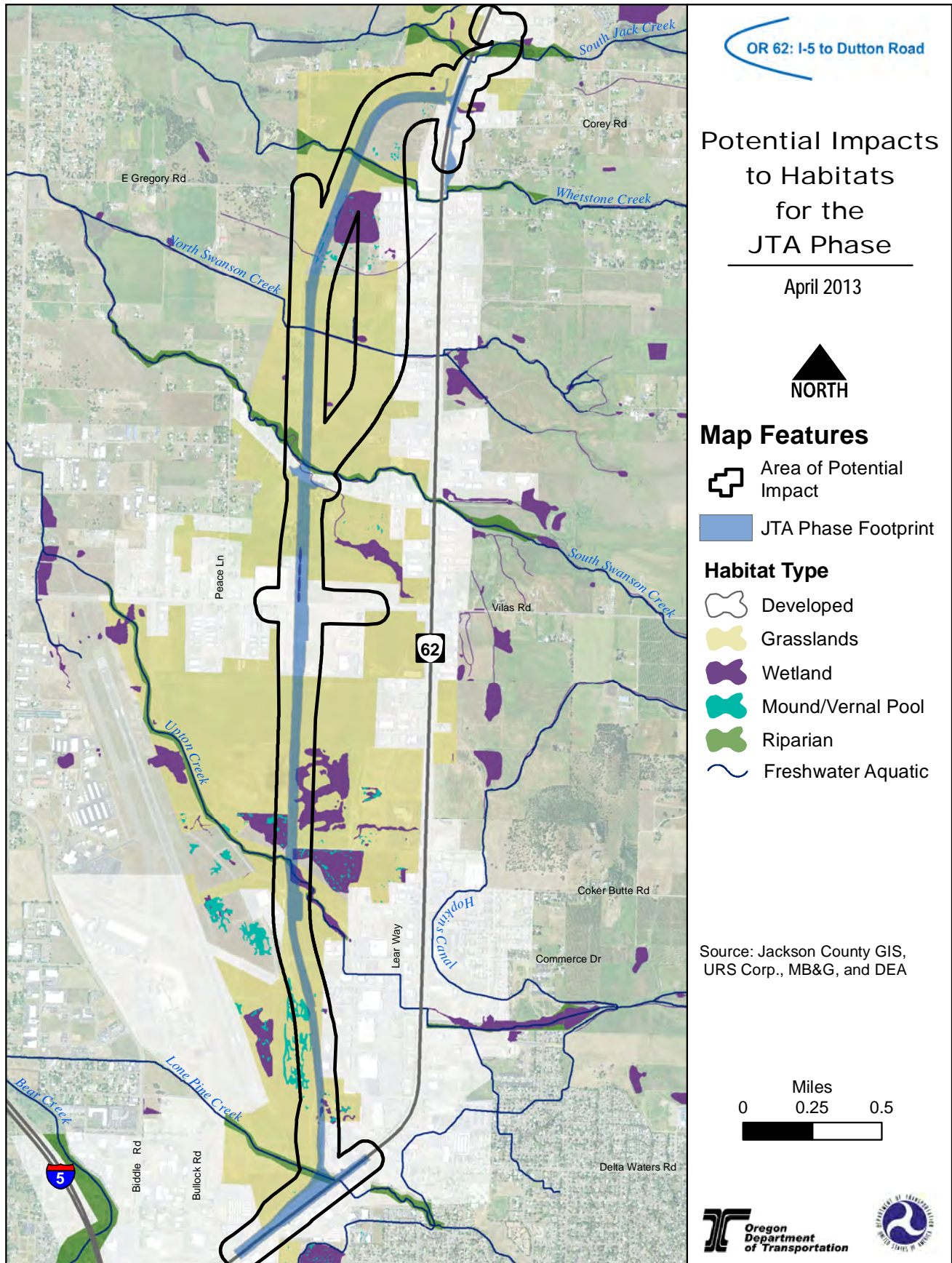


Figure 3.14-2 FEIS



3.14.5 Avoidance, Minimization, and/or Mitigation Commitments Incorporated into the Preferred Alternative

ODOT makes the following commitments.

JTA Phase

There are no mitigation commitments exclusive to the JTA phase.

JTA Phase and Preferred Alternative Subsequent to Construction of the JTA Phase

- ODOT will conduct tree-clearing activities outside the migratory bird nesting season (approximately March 1 – September 1) in compliance with the Migratory Bird Treaty Act. If clearing is necessary during the bird nesting season, a qualified biologist will survey the clearing areas for migratory bird nests prior to clearing. Nests containing eggs or young (active nests) will be avoided.
- ODOT will design all culverts to be fish passable with approved fish passage plans that meet Oregon's fish passage requirements.
- All new and replacement culverts will be dual box culverts. These dual box culverts will be designed to be either 2.2 or 1.5 times the active channel width and will have both a low flow channel for normal flows and a high flow channel to accommodate high-water events. The high flow channel will be dry most of the time, allowing animals up to the size of a deer to cross under the bypass.

Preferred Alternative Subsequent to Construction of the JTA Phase

There are no mitigation commitments exclusive to the Preferred Alternative.

3.15

Section 3.15 Content

- 3.15.1 Regulatory Setting
- 3.15.2 Affected Environment
- 3.15.3 Environmental Consequences
 - 3.15.3.1 Direct Impacts
 - 3.15.3.2 Indirect Impacts
 - 3.15.3.3 Construction Impacts
- 3.15.4 Avoidance, Minimization, and/or Mitigation Measures
- 3.15.5 Avoidance, Minimization, and/or Mitigation Commitments Incorporated Into the Preferred Alternative

3.15 Invasive Species

3.15.1 Regulatory Setting

Executive Order 13112 requires federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” FHWA guidance issued August 10, 1999 directs the use of the state’s noxious weed list to define the invasive plants that must be considered as part of the NEPA analysis for a proposed project. Invasive species include wildlife as well as plants.

The state of Oregon regulates noxious weeds under O.R.S. 570.510 and O.R.S. 570.540. O.R.S. noxious weed law states: “The state and the respective counties shall control any weeds designated as noxious by the state or the respective counties in any such county on land under their respective ownerships.” O.R.S. 570.540 states “The State Highway Commission, the respective county courts, reclamation districts and municipalities shall destroy or prevent the spread or seeding of any noxious weed...on any land owned by them or constituting the right-of-way for any highway, county road, drainage or irrigation ditch, power or transmission line, or other purposes under their respective jurisdictions.” ODA is responsible for regulating noxious weeds in Oregon and defines weed classes, which is used to prioritize and implement noxious weed control projects (ODA 2011a).

3.15.2 Affected Environment

The API used for the invasive species analysis is the same as for threatened and endangered species and for non-threatened and endangered species and is shown in Figure 3.13-1. State-listed noxious weeds are widespread throughout the API. Eight state-listed noxious weeds, listed in Table 3.15-1 are known to occur within the API. Of these, four are also on the Jackson County noxious weed list. All eight species are regionally abundant and two, yellow starthistle and purple loosestrife, represent an economic threat to the state of Oregon. Because noxious weeds are so widespread within the API, mapping individual populations and estimating quantities for each species is impractical. On average, noxious weeds cover between 40 and 75 percent of land with herbaceous groundcover within the API. Past land development practices and agricultural activities likely contributed to the widespread presence of noxious weeds within the API. No invasive wildlife threats within the API have been identified by USFWS or ODFW. Consequently, this analysis does not include invasive wildlife.

For further information regarding invasive species, including citations to source documents, refer to the *OR 62 Corridor Solutions Project Terrestrial Resources Technical Report*, November 2011. This report is available from the ODOT contact person identified on page i of this EIS.

Table 3.15-1 Noxious Weeds in API

Weed Name	Weed Class ¹	On Jackson County Noxious Weed List (yes/no)
Diffuse Knapweed (<i>Centaurea diffusa</i>)	B	Yes
Yellow Starthistle (<i>Centaurea solstitialis</i>)	B,T	No
Poison Hemlock (<i>Conium maculatum</i>)	B	No
Field Bindweed (<i>Convolvulus arvensis</i>)	B	No
Purple Loosestrife (<i>Lythrum salicaria</i>)	B,T	Yes
Medusahead (<i>Taeniatherum caput-medusae</i>)	B	No
Puncturevine (<i>Tribulus terrestris</i>)	B	Yes
Armenian (Himalayan) blackberry (<i>Rubus armeniacus</i> , <i>R. procerus</i> , <i>R. discolor</i>)	B	Yes

Notes:

¹ Weed Classes as defined by ODA:

B - Noxious weeds of economic importance (could cause production loss or increased control costs to agriculture) that are regionally abundant, but may have limited distribution in some counties.

T - Noxious weeds that represent an economic threat to the state of Oregon.

Sources: ODA 2011b; Terrestrial Resources Technical Report

3.15.3 Environmental Consequences

3.15.3.1 Direct Impacts

No Build Alternative

Implementation of the No Build Alternative would not directly promote or inhibit the spread of noxious weed species within the API. Other roadway construction and land development projects in or near Medford and White City would likely require control of noxious weeds and could reduce noxious weed abundance in those areas.

Build Alternatives and JTA Phase

The potential for both build alternatives and JTA phase to promote or inhibit the spread of noxious weeds would be the same.

Both build alternatives and the JTA phase would disturb the soil along the new roadways. These disturbed areas would primarily be compacted and covered with gravel. Noxious weeds would be more capable of growing in the compacted gravel areas than native plant species. Noxious weed seeds could spread from vehicles traveling along the constructed roadway and by wind.

3.15.3.2 Indirect Impacts

No Build Alternative

As described in Section 3.2, Land Use, build-out of the land within existing UGBs of Medford and Eagle Point and the White City UUCB would likely occur under the No Build Alternative, but plan amendments and zone changes to allow larger-scale development would be constrained. Construction of such development, although constrained, could indirectly introduce and spread noxious weeds within those locations.

Herbaceous plants have leaves and stems that die down to the soil level at the end of the year growing season. They have no persistent woody stem above ground.

Build Alternatives and JTA Phase

As described in Section 3.2, Land Use, the build alternatives and JTA phase could accelerate land development allowed by the Medford, Eagle Point, and Jackson County comprehensive plans, including within the White City UUCB, and reduce constraints on plan amendments and zone changes to allow larger-scale development within the Medford and Eagle Point UGBs. Construction of such larger-scale developments would not necessarily result in the spread and introduction of more noxious weeds than under the No Build Alternative.

3.15.3.3 Construction Impacts

No Build Alternative

The No Build Alternative would have no construction impacts and therefore would not indirectly promote or inhibit the spread of noxious weeds within the API.

Build Alternatives and JTA Phase

Construction of the project could introduce and spread noxious weeds within the API. Clearing and grading activities could introduce and spread noxious weeds by construction equipment and worker travel through existing seed sources within the API. Disturbed soil in newly graded areas could introduce and establish new populations of noxious weeds or spread existing populations. Since noxious weeds are already widespread within the API, project construction is not expected to create much of a change to the current conditions. The potential for increasing the spread and coverage of noxious weeds is expected to be low due to the already widespread distribution of noxious weeds within the project area.

3.15.4 Avoidance, Minimization, and/or Mitigation Measures

Construction of the project would provide an opportunity to reduce or control noxious weeds. Initial ground clearing and soil disturbance would remove existing noxious weeds along the right-of-way. Required BMPs would also be implemented during construction to limit the level of impacts.

These BMPs would reduce the potential for the introduction and establishment of noxious weeds:

- Use of mulches, topsoil, and seed mixes that are free of noxious weeds.
- Inspect and clean construction equipment prior to entering the construction area.
- Use integrated pest management strategies if noxious weeds begin to spread. Integrated strategies offer the best results and could include biological, manual, and chemical controls specific to the invasive target species.
- Monitor the finished build alternative to ensure that noxious weeds do not regain their foothold in the area. The monitoring period should be long enough to ensure establishment of all new mitigation and landscape areas. Set appropriate thresholds for invasive cover along with an adaptive management plan, to ensure that appropriate actions are taken to ensure successful eradication of noxious weeds.

In addition to these requirements, the use of regionally native plants for landscaping and restoration could avoid and minimize impacts of invasive species. If native plants are planted and become fully established, native plants may be able to resist noxious weeds from dominating the area in the future.

3.15.5 Avoidance, Minimization, and/or Mitigation Commitments Incorporated into the Preferred Alternative

ODOT makes the following commitments.

JTA Phase

There are no mitigation commitments exclusive to the JTA phase.

JTA Phase and Preferred Alternative Subsequent to Construction of the JTA Phase

- ODOT will use mulches, topsoil, and seed mixes that are free of noxious weeds.
- ODOT will inspect and clean construction equipment prior to entering the construction area and prior to leaving the construction area.
- ODOT will use integrated pest management strategies if noxious weeds begin to spread. Integrated strategies offer the best results and could include biological, manual, and chemical controls specific to the invasive target species.
- ODOT will monitor the finished build alternative to ensure that noxious weeds do not regain their foothold in the area. The monitoring period will be long enough to ensure establishment of all new mitigation and landscape areas. Thresholds will be appropriate for invasive cover. An adaptive management plan will be developed to ensure that appropriate actions are taken to ensure successful eradication of noxious weeds.
- ODOT will use regionally native plants for landscaping and restoration.

Preferred Alternative Subsequent to Construction of the JTA Phase

There are no mitigation commitments exclusive to the Preferred Alternative.

3.16

Section 3.16 Content

- 3.16.1 Regulatory Setting
 - 3.16.1.1 Criteria Pollutants
 - 3.16.1.2 Regional Conformity
 - 3.16.1.3 Project-Level Conformity
- 3.16.2 Affected Environment
- 3.16.3 Environmental Consequences
 - 3.16.3.1 Direct Impacts
 - 3.16.3.2 Indirect Impacts
 - 3.16.3.3 Construction Impacts
- 3.16.4 Avoidance, Minimization, and/or Mitigation Measures
 - 3.16.4.1 Operations Mitigation
 - 3.16.4.2 Construction Mitigation
- 3.16.5 Avoidance, Minimization, and/or Mitigation Commitments Incorporated Into the Preferred Alternative

3.16 Air Quality

This section discusses air quality and the potential impacts that could occur from the proposed project alternatives. Analyses are conducted to determine the effects of air pollutants along the project corridor for existing and future years; the results are compared to air quality standards.

3.16.1 Regulatory Setting

3.16.1.1 Criteria Pollutants

The Clean Air Act (CAA) as amended in 1990 is the federal law that governs air quality. This law sets standards for the quantity of pollutants that can be in the air. These standards are called National Ambient Air Quality Standards (NAAQS). Standards have been established for six criteria pollutants that have been linked to potential health concerns. The criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM), lead (Pb), and sulfur dioxide (SO₂). A region is a non-attainment area when designated by the US EPA when one or more monitoring stations in the region fail to attain the relevant standard.

An area that is considered **attainment** is an area that has not been found to not meet the National Ambient Air Quality Standards for the criteria pollutants.

Under the 1990 Clean Air Act Amendments (CAAA), the U.S. Department of Transportation cannot fund, authorize, or approve federal actions to support programs or projects that are not first found to conform to the State Implementation Plan (SIP). The SIP provides programs and methods to meet and maintain air quality standards within the state. Areas that have been non-attainment in the past, but now meet air quality standards, are called maintenance areas, and are not considered attainment until federally re-designated as such (usually after several years of demonstrating compliance with the standards). Conformity with the CAA takes place at the regional level for all projects and at the project level for federally-funded or approved projects. Any build alternative for a federal project must conform at both levels to be approved.

3.16.1.2 Regional Conformity

Regional level conformity in Oregon is concerned with how well the region meets air quality standards for those areas that have been designated non-attainment or maintenance. Within Oregon, there are areas designated non-attainment or maintenance for CO, O₃, and PM; all areas of the State are attainment for the other criteria pollutants. At the regional level, Metropolitan Planning Organizations (MPOs) develop Regional Transportation Plans (RTPs) that include all of the transportation projects planned for that region over at least the next 20 years. Based on the projects included in the fiscally constrained RTP, the MPO uses models to determine whether or not the implementation of those projects meets the transportation emission budgets or other tests showing that attainment requirements of the CAA are met. If all requirements for regional conformity are met, the FHWA and the Federal Transit Administration (FTA) jointly issue a conformity determination, stating that the RTP conforms to the SIP for achieving the goals of the CAA. MPOs are also required to develop a Transportation Improvement Program (TIP), which includes projects that will be funded and implemented in the near term. Like RTPs, the TIP is required to meet regional conformity requirements.

3.16.1.3 Project-Level Conformity

In addition to meeting regional-scale conformity requirements, individual federal projects must meet certain project-level conformity requirements. Federal projects in MPO areas designated as non-attainment or maintenance are required to be in a conforming RTP and TIP. When an area is classified as non-attainment or maintenance for CO and/or PM, conformity at the project-level includes consideration of “hot-spot” analysis, which is an analysis of localized pollutant concentrations. In general, pollutant concentrations due to building the project need to be below the NAAQS. Additional requirements, such as PM control measures and non-interference with Transportation Control Measures (TCMs), sometimes apply for project-level conformity, depending on the area and project.

Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS requirements, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the CAA. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead federal agency for administering the CAA and has certain responsibilities regarding the health effects of air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8,430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (<http://www.epa.gov/ncea/iris/index.html>). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (<http://www.epa.gov/ttn/atw/nata1999/>). These compounds include acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis, contained in FHWA’s Interim Guidance Document on MSAT Analysis included in Appendix I, even if vehicle activity, measured as vehicle miles traveled (VMT), increases by 102 percent, as assumed, a combined reduction of 83 percent in the total annual emission rate for the priority MSAT is projected from 2010 to 2050 due to these fuel and engine improvements.

Mobile Source Air Toxics (MSATs) are compounds emitted from highway vehicles and non-road equipment which are known or suspected to cause cancer or other serious health and environmental effects.

Vehicle miles traveled (VMT) is the total number of miles traveled by vehicles on roadways within a given area.

The EPA is responsible for the establishment of NAAQS, national guidance, and guidelines for the uniform and scientifically reliable study of air pollutants. To date, there are no NAAQS for MSATs, and there are no established criteria for determining when MSAT emissions should be considered a significant issue. In its December 2012 interim guidance update for MSATs in NEPA documents, included in Appendix I, the FHWA has identified three levels of analysis:

- Projects with No Meaningful Potential MSAT Effects, or Exempt Projects;
- Projects with Low Potential MSAT Effects; and
- Projects with Higher Potential MSAT Effects.

3.16.2 Affected Environment

Attainment Status

The API for air quality is the Medford-Ashland Air Quality Maintenance Area (AQMA), which is classified as a maintenance area for PM_{10} , and the Medford UGB, which is currently classified as a maintenance area for CO as shown in Figure 3.16-1.

Air quality emissions in the API are currently managed under the provisions of the SIP maintenance plans for CO and PM_{10} . Current air quality monitoring in the API shows CO, PM_{10} , and $PM_{2.5}$ in compliance with their respective state and federal standards. Of these three pollutants, only 24-hour $PM_{2.5}$ has shown an exceedance of its respective standard since 1999 (availability of monitoring records). The last recorded exceedance of the 24-hour $PM_{2.5}$ standard (98th percentile or maximum 24-hour value) was $36 \mu\text{g}/\text{m}^3$ in 2005 (the standard is $35 \mu\text{g}/\text{m}^3$). Table 3.16-1 provides a summary of the State of Oregon and federal standards for the criteria pollutants.

Climatic and Meteorological Conditions

The effects of pollutant emissions on air quality are strongly tied to atmospheric conditions. In addition, vehicle emissions themselves are closely tied to temperature. In the Rogue Valley, the prevailing winds blow primarily in a north-south pattern from October through March, and from the northwest from April through September. Mean wind speeds are typically less than 5 mph. Much of the area lies in somewhat of a rain shadow, sheltered from the Pacific Ocean by the Siskiyou Mountains to the west. The average annual precipitation in Medford is less than 20 inches, with most precipitation falling from November through March. Temperatures in Medford are usually more extreme than the rest of western Oregon, approximately 55 days per year have temperatures above 90°F and approximately 86 days per year have temperatures below 32°F.

Monitoring Data and Air Quality Trends

The Oregon DEQ operates a network of monitors throughout the Medford-Ashland area. In general, these stations are located in areas where the agency believes there are air quality problems, or areas that are designated non-attainment. Below is more detailed information about CO, particulate matter, and ozone, the criteria pollutants DEQ is currently monitoring in the Medford-Ashland area.

CO

Medford is currently designated as maintenance for CO. The main sources of CO emissions are automobiles. The maximum monitored 1-hour and 8-hour CO concentrations in 2009 were 3.4 ppm and 2.4 ppm, measured at the Rogue Valley Mall. The Rogue Valley Mall is the only current CO monitoring station. A nearby site at the Brophy Building (approximately one mile south of the Mall site, also along the I-5 corridor) was discontinued after 2004. The AAQS for CO are a maximum 1-hour average of 35 ppm and 8-hour average of 9 ppm. There is a general downward trend in CO concentrations at the Rogue Valley Mall monitoring station.

For further information regarding air quality, including citations to source documents, refer to the *OR 62 Corridor Solutions Project Air Quality Technical Report*, June 2011. This report is available from the ODOT contact person identified on page i of this EIS.

Figure 3.16-1

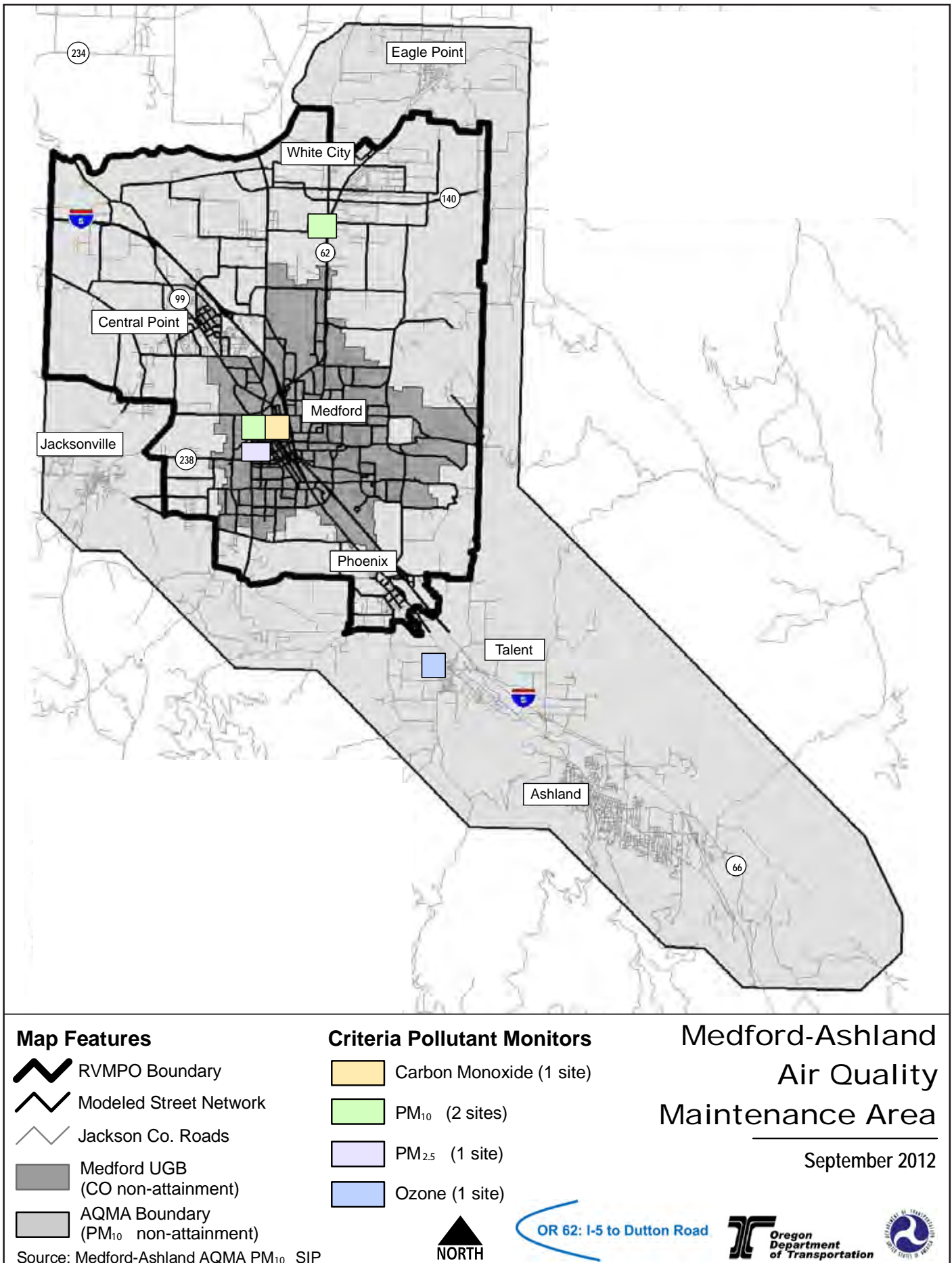


Table 3.16-1 Summary of NAAQS and Oregon Air Quality Standards

Criteria Pollutant	Averaging Time	State Standard	Federal Standard	Health and Atmospheric Effects	Typical Sources
Ozone (O ₃)	8 hours	0.075 ppm	0.075 ppm	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include a number of known toxic air contaminants.	Low-altitude ozone is almost entirely formed from reactive organic gases (ROG) and nitrogen oxides (NOX) in the presence of sunlight and heat. Major sources include motor vehicles and other mobile sources, solvent evaporation, and industrial and other combustion processes. Biologically-produced ROG may also contribute.
Carbon Monoxide (CO)	1 hour 8 hours	35 ppm 9 ppm	35 ppm 9 ppm	CO is an asphyxiant. CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.
Respirable Particulate Matter (PM ₁₀)	24 hours Annual	150 µg/m ³ 50 µg/m ³	150 µg/m ³ —	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many aerosol and solid compounds are part of PM ₁₀ .	Dust- and fume-producing industrial and agricultural operations; combustion smoke; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources (wind-blown dust, ocean spray).
Fine Particulate Matter (PM _{2.5}) ^a	24 hours Annual	—	35 µg/m ³ 15 µg/m ³	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – considered a toxic air contaminant is in the PM _{2.5} size range. Many aerosol and solid compounds are part of PM _{2.5} .	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical (including photochemical) reactions involving other pollutants including NOX, sulfur oxides (SOx), ammonia and ROG.
Nitrogen Dioxide (NO ₂)	Annual Hourly	0.053 ppm	0.053 ppm 0.10 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain.	Motor vehicles and other mobile sources; refineries; industrial operations.
Sulfur Dioxide (SO ₂)	1 hour 3 hours	N/A 0.50 ppm	0.075 ppm N/A	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing.
Lead (Pb)	Rolling 3-month average	0.15 µg/m ³	0.15 µg/m ³	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also considered a toxic air contaminant.	Primary: lead-based industrial process like battery production and smelters. Previously: lead paint, leaded gasoline. Moderate to high levels of aerially deposited lead from gasoline may still be present in soils along major roads, and can be a problem if large amounts of soil are disturbed.

Notes: ppm = parts per million; µg/m³ = micrograms per cubic meter

^aDiesel exhaust particulate matter is part of PM₁₀ and, in larger proportion, PM_{2.5}. The U.S. EPA has identified various organic compounds that are precursors to ozone and PM_{2.5} as toxic air contaminants. There is no threshold level of exposure for adverse health effects determined for toxic air contaminants, and control measures may apply at ambient concentrations below any criteria levels specified for these pollutants or the general categories of pollutants to which they belong.

Particulate Matter

The Medford-Ashland AQMA is designated as maintenance for PM_{10} and attainment for $PM_{2.5}$. Particulate matter monitoring data is available from 1985 to 2009. The highest monitored average 24-hour PM_{10} concentration in 2009 was $46 \mu\text{g}/\text{m}^3$. The highest concentration recorded since 2000 was $78 \mu\text{g}/\text{m}^3$ (in 2007). These values are well below the $150 \mu\text{g}/\text{m}^3$ standard. The annual average concentration in 2009 was $16.4 \mu\text{g}/\text{m}^3$, and the highest annual concentration since 2000 was $23.2 \mu\text{g}/\text{m}^3$ in 2004, well below the $50 \mu\text{g}/\text{m}^3$ standard.

The highest monitored average 24-hour $PM_{2.5}$ concentration in 2009 was $33 \mu\text{g}/\text{m}^3$. The highest concentration recorded since 2000 was $36 \mu\text{g}/\text{m}^3$ (in 2005). These values are close or exceed the $35 \mu\text{g}/\text{m}^3$ standard, however the trend has been downward over the last several years. The annual average concentration in 2009 was $9.6 \mu\text{g}/\text{m}^3$, and the highest annual concentration since 2000 was $14.0 \mu\text{g}/\text{m}^3$ in 2002, both below the $15 \mu\text{g}/\text{m}^3$ standard. The trend for annual average concentrations has also been downward over the last several years.

Ozone

Ozone is trending down on average since 1991. The 8-hour standard for ozone is 0.075 ppm and is measured as the three year average of the fourth highest value. For the City of Medford, the fourth highest average occurred between 2008 and 2010, with an average value of 0.065 ppm.

3.16.3 Environmental Consequences

An assessment of criteria air pollutant and MSAT emissions was performed based on traffic volumes for the No Build Alternative, build alternatives, and the JTA phase. Localized CO concentrations, or “hot-spots”, were modeled using standardized ODOT and EPA modeling procedures. A qualitative hot-spot analysis was determined to be unnecessary for PM_{10} , based on vehicle miles traveled (VMT). “Hot spot” analysis for CO was conducted at the intersections shown in Figure 3.16-2.

Regional and Project-Level Air Quality Conformity

The transportation conformity rule establishes project-level analysis requirements that apply in CO non-attainment and maintenance areas. These include a requirement for representative quantitative CO hot-spot modeling at locations affected by a proposed project operating or expected to operate at a level-of-service (LOS) D or worse. The specific modeled intersections are described below in Section 3.16.3.1, under *CO Hot Spot Analysis*.

The project is included in the Air Quality Conformity Determination (AQCD) for 2012-2015 Metropolitan Transportation Improvement Program (MTIP) & 2009-2034 RTP – as amended, both adopted by the RVMPO Policy Committee on January 24, 2012. The conformity determination was approved by USDOT on June 27, 2012. The design concept and scope of the proposed project in this NEPA document is consistent with the project description in the 2012-2015 MTIP, the 2009-2034 RTP and the 2013-2038 RTP and the assumptions in the RVMPO’s regional emissions analysis for this project. The project listings from the 2009-2034 RTP and the 2013-2038 RTP are included in Appendix I. The project, including the JTA, was included as part of the conformity determination for the 2013-2038 RTP.

The RVMPO Policy Committee adopted a 2013-2038 RTP and associated air quality conformity determination at its March 26, 2013, meeting. The USDOT conformity determination is expected shortly. The FEIS has incorporated project information from the 2013-2038 RTP into Appendix I, to demonstrate both financial constraint as well as meeting regional air quality conformity requirements.

3.16.3.1 Direct Impacts

Build Alternatives

Project Level Conformity Analysis

The project lies within the Medford-Ashland AQMA, which is maintenance for PM_{10} , and the Medford UGB, which is maintenance for CO. To meet project-level conformity, the hot spot analysis must demonstrate that the project would not cause or contribute to a violation of the NAAQS. This analysis, described in more detail below, found that the project would be in conformance with the CO and PM_{10} State Implementation Plan and that the project would not:

- cause or contribute to any new violations of any standard;
- increase the frequency or severity of any existing violation or any standard; or
- delay timely attainment of any transportation control measures.

CO Hot –Spot Analysis

Modifications in traffic patterns can create local hot spots near congested intersections. Predictions of existing and future localized air pollution concentrations in the air quality API were made for CO using MOBILE 6.2 emission factors and the CAL3QHC model. The CAL3QHC model uses information about traffic characteristics, signal timing, roadway configurations, vehicle emission factors, and meteorology to predict CO concentrations at various user-defined locations, or receptors, near an intersection. While traffic volumes generally increase over time (without any other roadway changes), vehicle emission factors are reduced due to engine improvements in newer model years. Based on emission factors and volumes for the three modeled years, peak emissions are likely encountered during the first modeled year (2007) and decrease with each year. This trend is observed for the No Build Alternative in the impact results shown below in Table 3.16-3, with the highest impacts occurring during 2007.

Signalized intersections for the CO analysis were selected using traffic data from the project traffic analysis, following ODOT and EPA guidance (ODOT, 2008 and EPA, 1992, respectively). The guidance recommends ranking intersections based on level of service (LOS) and traffic volumes (vehicles per hour [vph]) to select the intersections where CO impacts are most likely to occur. Signalized intersections expected to operate at LOS D, E, or F must be included in the ranking analysis. Table 3.16-2 provides a summary of LOS, volume-to-capacity ratio (v/c), and vph for each intersection and scenario, and ranks the intersections based on the ODOT and EPA guidance described above. From this table, a further breakdown of intersections for analysis was made based on intersection similarities, by geometry and operation; intersections were 'paired' to eliminate duplicate analyses. In these cases, only the worst-ranked intersection of the pair is analyzed. For example, the Poplar Drive and OR 62 intersection has similar geometry and operation to the Delta Waters Road and OR 62 intersection, but overall, the Poplar Drive and OR 62 intersection is ranked 'worse' by LOS, v/c, and vph. Both the Poplar Drive and OR 62 intersection and the Delta Waters Road and OR 62 intersection show improvement for both Build Alternatives over their respective No Build Alternatives. The Poplar Drive and OR 62 intersection is grade separated for the DI Alternative, therefore it is not considered for intersection analysis. It is expected that the No Build impacts will be higher than the Build impacts, based on the LOS, v/c, and vph. Therefore, an assessment of the worst-case intersection (Poplar Drive and OR 62) for the No Build and SD Alternative (including the JTA phase) for each analysis year, should be a conservative demonstration for the assessment of all scenarios of the Delta Waters Road and OR 62 intersection, which shows an improvement in the DI Alternative over the SD Alternative.

Figure 3.16-2

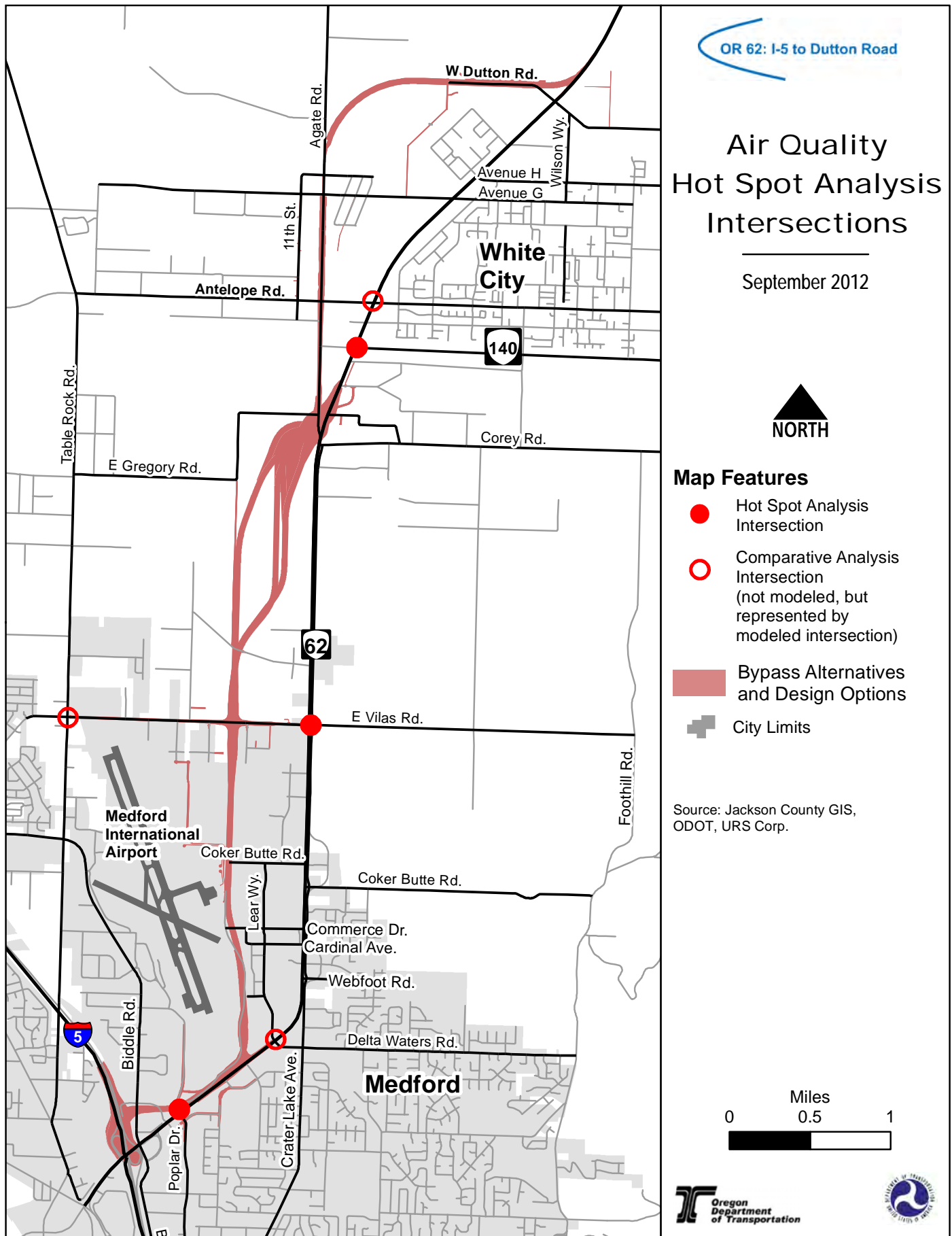


Figure 3.16-2 FEIS

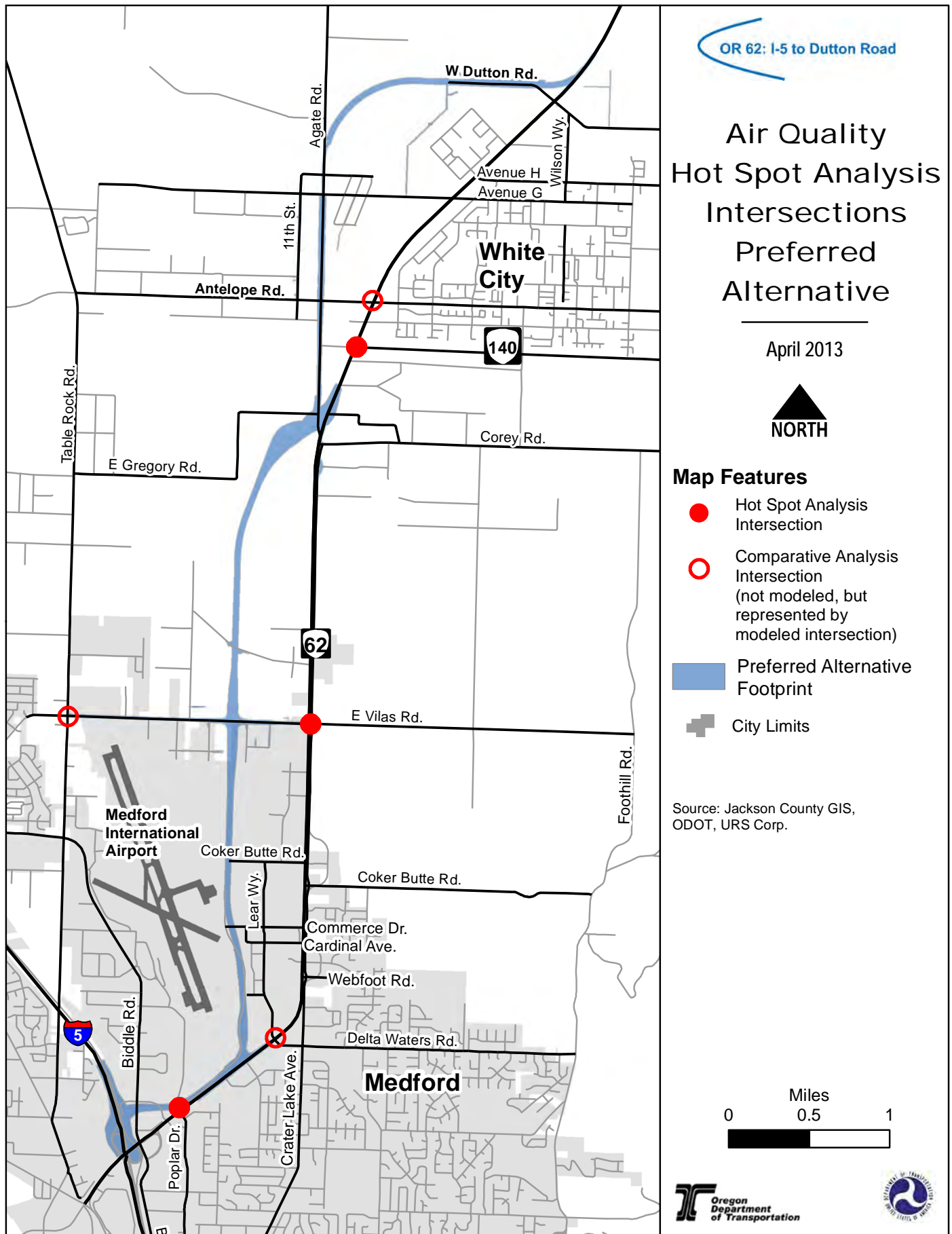


Table 3.16-2 Intersection Traffic Parameter Summary and Ranking

Intersection	Base Yr 2007			2015 No Build			2015 DI			2015 SD			2015 JTA			2035 No Build			2035 DI			2035 SD			2035 JTA			Overall Ranking
	LOS	v/c	VPH	LOS	v/c	VPH	LOS	v/c	VPH	LOS	v/c	VPH	LOS	v/c	VPH	LOS	v/c	VPH	LOS	v/c	VPH	LOS	v/c	VPH	LOS	v/c	VPH	
Poplar & OR 62	E	1.02	5018	E	1.04	5182	--	--	--	D	0.82	4345	D	0.90	5590	F	1.05	5625	--	--	D	0.93	4935	E	1.06	6415	1	
Antelope & OR 62	D	0.83	3194	D	0.84	3539	D	0.79	2820	C	0.73	2875	D	0.91	3825	F	1.04	4625	E	0.95	3675	E	0.93	3870	F	1.08	5025	2
Delta Waters & OR 62	D	0.86	4581	D	0.88	4805	D	0.65	3240	D	0.70	3810	C	0.66	3310	E	1.00	5450	D	0.70	3670	D	0.81	4330	D	0.71	3745	3
OR 140 & OR 62	C	0.86	3185	D	1.00	3678	C	0.74	3380	C	0.82	3490	C	0.86	4145	F	1.54	4735	D	1.06	4195	D	1.04	4385	F	1.14	5460	4
Vilas & Table Rock	C	0.81	2773	D	0.94	3162	E	0.97	3365	D	0.92	3385	D	0.91	3260	F	1.31	4125	D	0.90	4050	C	0.85	4160	E	1.19	3905	5
Crater Lake Ave & Delta Waters	E	0.94	2572	D	0.84	2515	E	0.84	2525	D	0.86	2565	D	0.77	2285	F	0.99	2920	E	0.99	2820	E	0.98	2855	D	0.84	2575	6
Owens & OR 62	--	--	--	--	--	--	--	--	--	D	0.53	2990	--	--	--	--	--	--	--	--	--	D	0.62	3520	--	--	--	7
King Center & OR 62	--	--	--	D	0.70	4063	D	0.47	2630	--	--	--	D	0.50	0	E	0.92	4875	D	0.53	3090	--	--	--	D	0.61	3375	8
Vilas & OR 62	C	0.86	3945	D	0.99	4283	C	0.40	1895	C	0.44	2160	C	0.79	2845	F	1.38	5430	C	0.49	2395	C	0.56	2760	D	0.95	3515	9
Lawnsdale Rd & Biddle Rd	B	0.58	1771	B	0.57	1932	F	0.48	1735	A	0.46	1655	F	0.51	1755	F	0.57	2070	F	0.50	2030	F	0.47	2045	F	0.58	2065	10
Biddle & Table Rock	C	0.69	2489	C	0.72	2860	C	0.63	2570	C	0.73	2705	C	0.67	2570	D	1.01	3505	D	0.97	3380	D	0.96	3380	D	0.97	3350	11

Notes:

"Paired" intersections (similar geometry and operation) are shown in matching colors:

Poplar/OR 62 and Delta Waters/OR 62
Antelope/OR 62 and OR 140 / OR 62
Vilas/Table Rock and Vilas / OR 62

(Note: for each scenario/year, only the worst-case of the pair is color coded.)

Values in bold indicate 'top three' worst value for scenario/year.

Values in italic indicate the worst-case scenario for the intersection pair; this determines the intersection for modeling analysis.

Source: Traffic Technical Report, Southern Oregon Transportation Engineering, LLC (May 2011)

Therefore, these three intersections were modeled: Poplar Drive and OR 62; Vilas Road and OR 62; and OR 140 and OR 62 because these intersections are the project intersections where elevated CO concentrations have the greatest potential to occur. Other intersections having the potential for LOS D through F under at least one alternative and analysis year are represented by at least one of these modeled intersections, by geometry and operation. With lower volume and/or better LOS, the other intersections are assumed to have the same or better predicted impacts than the modeled intersections.

Modeled CO concentrations were found to be within air quality standards, as indicated in Table 3.16-3. Therefore, the project would not cause or contribute to any adverse localized CO impacts or violations in the air quality API for CO. In addition, for each modeled intersection and analysis year, the build alternatives show the same or slightly reduced CO levels than the No Build Alternative. The reduction in CO levels is likely due to improved traffic movement and reduced congestion for the build alternatives and some of the JTA phase intersections. The one exception of this is for the OR 140 and OR 62 intersection under the JTA phase in 2035, which shows a slight increase in CO levels, although the levels are still within the standard. This is attributed to the increase in vehicle volume; even though the capacity (v/c) improves over the No Build, it is not enough to counter the substantial increase in traffic volume forecast at this intersection.

Table 3.16-3 Maximum Predicted 1-Hour and 8-Hour CO Concentrations (ppm)¹

Year	Duration	NAAQS	No Build Alternative	SD Alternative	DI Alternative	JTA Phase
Poplar Drive and OR 62						
2007	1-Hour	35	8.9	NA	NA	NA
	8-Hour	9	6.8	NA	NA	NA
2015	1-Hour	35	7.0	6.3	NA	7.0
	8-Hour	9	5.3	4.8	NA	5.3
2035	1-Hour	35	6.5	6.0	NA	6.4
	8-Hour	9	4.9	4.6	NA	4.9
Vilas Road and OR 62						
2007	1-Hour	35	6.9	NA	NA	NA
	8-Hour	9	5.2	NA	NA	NA
2015	1-Hour	35	5.8	4.4	4.0	4.6
	8-Hour	9	4.4	3.3	3.0	3.5
2035	1-Hour	35	5.9	4.2	4.0	4.6
	8-Hour	9	4.5	3.2	3.0	3.5
OR 140 and OR 62						
2007	1-Hour	35	6.6	NA	NA	NA
	8-Hour	9	5.0	NA	NA	NA
2015	1-Hour	35	5.8	5.3	5.1	5.3
	8-Hour	9	4.4	4.0	3.9	4.3
2035	1-Hour	35	6.0	5.5	5.7	6.3
	8-Hour	9	4.6	4.2	4.0	4.8

Note: NA – Not Applicable. There is no modeling for build alternatives in Year 2007. In addition, the DI Alternative is grade separated over the Poplar Drive and OR 62 intersection, so no modeling is conducted for this alternative.

¹ Includes 1-hour background concentration of 2 ppm. 8-Hour concentration = 1-Hour concentration times persistence factor of 0.76.

The modeled intersections in Table 3.16-3 are expected to be the worst-case intersections for the OR 62 project; all other intersections in the project area are expected to have impacts/concentrations equal to or below these levels.

PM₁₀ Hot –Spot Analysis

PM₁₀ hot spot analysis was addressed using the maximum annual average daily traffic (AADT) and VMT data on the OR 62 corridor. The maximum AADT for the project is 68,200 vehicles, occurring under the DI Alternative in 2035. This is below the ODOT threshold AADT criteria of 122,000 AADT for areas west of the Cascades, and indicates that the project would not cause a violation of the air quality standard for PM₁₀ (the project is not a “Project of Air Quality Concern” as defined in the transportation conformity regulations).

MSATs

According to the EPA, “significant scientific uncertainties remain in the understanding of the relationship between adverse health effects and near-road exposure, including the exposures of greatest concern, the importance of chronic versus acute exposures, the role of fuel type (e.g., diesel or gasoline) and composition (e.g., percent aromatics), relevant traffic patterns, the role of co-stressors including noise and socioeconomic status, and the role of differential susceptibility within the “exposed” populations”. (EPA 2007a)

Chapter 3 of the EPA Regulatory Impact Analysis for the 2007 MSAT rules states that there are a number of additional significant uncertainties associated with the air quality, exposure and risk modeling. The modeling also has certain key limitations such as the results are most accurate for large geographic areas, exposure modeling does not fully reflect variation among individuals, and non-inhalation exposure pathways and indoor sources are not taken into account. (EPA 2007b)

Greater potential for MSAT effects typically occurs for roadways with an annual averaged daily traffic (AADT) volume of 140,000 to 150,000 vehicles or more per day in 2035 (future year). The maximum predicted average daily traffic (ADT) volume for either No Build or build alternatives for the project is 68,202 in the 2035 analysis year (DI Alternative). Because ADT forecasts are not adjusted for lower traffic volumes on weekends, ADT volumes are typically slightly higher than AADT volumes. The FHWA Interim Guidance on MSATs classifies this OR 62, I-5 to Dutton Road project as a project with low potential for MSAT effects because the forecast ADT of 68,202 is well below the 140,000 AADT threshold. Therefore, only a qualitative MSAT analysis is required for this project.

Under the 2012 update of the FHWA Interim Guidance, the OR 62: I-5 to Dutton Road project remains classified as having a low potential for MSAT. Therefore, only a qualitative MSAT analysis is required for this project and the new model from the 2012 interim guidance for quantitative analysis was not applied.

Technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects on this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can provide a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled A Methodology for Evaluating Mobile Source Air Toxic Emissions among Transportation Project Alternatives (www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemiissions.cfm). Additional guidance from FHWA regarding incomplete or unavailable information, as specified in 40 CFR 1502.22, is included in Appendix I of this EIS.

An update of the guidance from FHWA has been added to Appendix I.

Table 3.16-4 Traffic Data Summary Comparison

Scenario	Maximum Average Daily Trips (ADT)	Vehicle Miles Traveled (VMT)	
		Daily	Annual
Existing Year 2007			
Existing Year 2007	52,021	412,999	150,744,598
Design Year 2015			
Design Year 2015 No Build	53,336	430,915	157,284,153
Design Year 2015 SD Alternative	53,268	524,665	191,502,708
Design Year 2015 DI Alternative	58,195	521,168	190,226,390
Design Year 2015 JTA Phase	56,600	429,124	156,630,148
Percent Increase			
Percent Increase from 2007 to 2015 No Build	2.5%	4.3%	4.3%
Percent Increase from 2015 No Build to 2015 SD Alternative	-0.1%	22%	22%
Percent Increase from 2015 No Build to 2015 DI Alternative	9.1%	21%	21%
Percent Increase from 2015 No Build to 2015 JTA Phase	6.1%	-0.4%	-0.4%
Percent Increase from 2015 SD Alternative over DI Alternative	-8.5%	0.67%	0.67%
Percent Increase from 2015 SD Alternative over JTA Phase	-5.9%	22.26%	22.26%
Percent Increase from 2015 DI Alternative over JTA Phase	2.8%	21.45%	21.45%
Net Difference (2007 and 2015 No Build)	1,315	17,917	6,539,554
Net Difference (No Build and SD Alternative)	(68)	93,749	34,218,556
Net Difference (No Build and DI Alternative)	4,859	90,253	32,942,237
Net Difference (No Build and JTA Phase)	3,264	(1,792)	(654,005)
Net Difference (SD Alternative and DI Alternative)	(4,926)	3,497	1,276,319
Net Difference (SD Alternative and JTA Phase)	(3,331)	95,541	34,872,560
Net Difference (DI Alternative and JTA Phase)	1,595	92,044	33,596,242
Future Year 2035			
Future Year 2035 No Build	60,010	528,066	192,744,120
Future Year 2035 SD Alternative	59,687	675,871	246,692,855
Future Year 2035 DI Alternative	68,202	652,564	238,185,700
Future Year 2035 JTA Phase	63,702	510,781	186,435,204
Percent Increase			
Percent Increase from 2007 to 2035 No Build	15%	28%	28%
Percent Increase from 2035 No Build to 2035 SD Alternative	-0.5%	28%	28%
Percent Increase from 2035 No Build to 2035 DI Alternative	14%	24%	24%
Percent Increase from 2035 No Build to 2035 JTA Phase	6%	-3%	-3%
Percent Increase from 2035 SD Alternative over DI Alternative	-12%	3.6%	3.6%
Percent Increase from 2035 SD Alternative over JTA Phase	-6.3%	32.32%	32.32%
Percent Increase from 2035 DI Alternative over JTA Phase	7.1%	27.76%	27.76%
Net Difference (2007 and 2035 No Build)	7,990	115,067	41,999,521
Net Difference (No Build and SD Alternative)	(323)	147,805	53,948,735
Net Difference (No Build and DI Alternative)	8,192	124,497	45,441,581
Net Difference (No Build and JTA Phase)	3,691	(17,285)	(6,308,916)
Net Difference (SD Alternative and DI Alternative)	(8,515)	23,307	8,507,155
Net Difference (SD Alternative and JTA Phase)	(4,014)	165,089	60,257,651
Net Difference (DI Alternative and JTA Phase)	4,500	141,782	51,750,496

Source: Traffic Technical Report, Southern Oregon Transportation Engineering, LLC (May 2011)

For each alternative (No Build and both build alternatives, including the JTA phase), the amount of MSATs emitted would be proportional to the VMT, assuming that other variables, such as fleet mix, are the same for each alternative. The daily and annual VMT for each alternative and year are shown in Table 3.16-4.

The annual VMT estimated for each of the build alternatives is slightly higher than that for the No Build Alternative, because the additional capacity (at the bypass) increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for the build alternatives along the highway corridor (the bypass), along with a corresponding decrease in MSAT emissions along the parallel routes (in most cases, including the existing Highway 62). The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds. According to EPA's MOBILE 6.2 emissions model, emissions of all of the priority MSATs, except for diesel particulate matter, decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

The estimated VMT under each of the build alternatives is between 24 and 28 percent greater than VMT under the No Build Alternative (for year 2035, including the Bypass VMT). Therefore, it is expected that the overall MSAT emissions would be no more than this percentage greater. VMT for the JTA phase is lower than the No Build Alternative. Regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 83 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

A 2012 update of the FHWA interim guidance regarding MSATs states that the EPA model forecasts "significantly higher diesel PM emissions, especially for lower speeds," compared to the previous model (FHWA 2012). MSAT emissions nationwide are projected to decline more rapidly under EPA's new model, since it incorporates regulations that were not in place at the time that the previous model was developed.

The additional travel lanes contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under each alternative there may be localized areas where ambient conditions of MSATs could be higher under certain build alternatives than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the additional turn lanes at some intersections and along the Bypass routes under the build alternatives. However, as discussed above, the magnitude and duration of these potential increases compared to the No Build Alternative cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the build alternative could be higher relative to the No Build Alternative; however, this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in locations where traffic shifts away from them (such as on the existing Highway 62 route under the build alternatives). However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will, over time, cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

Additional analysis conducted since the publication of the DEIS indicates that the Preferred Alternative will reduce exposure to MSATs in two ways. First, the Preferred Alternative will divert traffic from existing OR 62 and other parallel routes, especially Biddle Road, Table Rock Road and Foothills Road. More residential uses are located along Biddle Road, Table Rock Road and Foothills Road than along the bypass and many more commercial uses are located along

existing OR 62, Biddle Road, and Table Rock Road than along the bypass. These comparisons will also apply in the future under applicable land use plans. Second, travel speeds will be higher on the bypass than on existing OR 62, Biddle Road, Table Rock Road, and Foothills Road.

The Preferred Alternative is also expected to lower levels of diesel PM at the Bear Creek Greenway. The Bear Creek Greenway is the only public park adjacent to the Preferred Alternative. The Preferred Alternative will disperse traffic at the I-5 Interchange, compared to the No Build Alternative. Under the No Build Alternative, all traffic moving between I-5 is concentrated on existing OR 62. The Preferred Alternative enables traffic moving between I-5 and the bypass to avoid existing OR 62. Traffic volumes on existing OR 62 west of I-5, where existing OR 62 crosses the Bear Creek Greenway, are forecast to be lower under the Preferred Alternative than under the No Build Alternative. This will lower diesel PM at that location.

3.16.3.2 Indirect Impacts

No Build Alternative

There would be no indirect impacts related to air quality under the No Build Alternative, however, air quality could worsen with increases in congestion and vehicle queuing due to congestion.

Build Alternatives and JTA Phase

The indirect impacts related to air quality under the build alternatives have been considered in the travel demand model in the traffic analysis. The forecast traffic volumes used to analyze the air quality impacts of the project alternatives were based on the future expected land use, growth and employment information. These analysis methodologies include expected traffic from development in the region. Therefore, the indirect impacts related to air quality have been considered in the direct analysis. The project's effect on the development rate and the potential to induce expansion of the UGB would affect air quality.

3.16.3.3 Construction Impacts

No Build Alternative

There would be no construction impacts under the No Build Alternative.

Build Alternatives and JTA Phase

Construction impacts on air quality associated with the build alternatives would be temporary and minimal. Construction is expected to last approximately two years for the JTA phase and another two years for the build alternatives.

Potential air pollutant emissions from construction include the following: emissions from workers' vehicles and delivery truck exhaust, heavy equipment exhaust, and fugitive dust. Combustion emissions would be generated during construction from construction vehicles and equipment (PM₁₀, PM_{2.5}, CO, SO₂, and NO₂), along with potential increases in combustion emissions from other vehicles if construction caused congestion.

Fugitive emissions of particulate matter would be associated with demolition, ground excavation, and cut-and-fill operations. These emissions would vary depending on many factors, including the level of activity, specific tasks, specific equipment, and weather conditions (wind speed and precipitation). Fugitive dust emissions also depend on soil characteristics, such as moisture and silt content. The main construction impacts would cause emissions from ground disturbance (fugitive dust), and would potentially be generated for several months at a time, but in localized areas, and therefore more easily contained. Most of the construction impacts on air quality would be short-term in duration and, therefore, would not result in adverse or long-term conditions.

3.16.4 Avoidance, Minimization, and/or Mitigation Measures

3.16.4.1 Operations Mitigation

Because no exceedances of state or federal air quality standards are predicted, no design or operational changes would be required for air quality mitigation.

3.16.4.2 Construction Mitigation

During construction, all heavy-duty equipment would be maintained to minimize combustion emissions. Standard operating procedures would be incorporated into project construction in order to reduce potential sources of fugitive dust.

Contractors are also required to comply with ODOT Standard Specifications Section 290.30, which provides measures for environmental protection, including air quality. Categories of air pollution control measures include: vehicle and equipment idling; dust control and permitting; and burn restrictions. Construction impacts could be mitigated using the following techniques:

1. Cover stockpiles and apply water (or other dust suppressant material) to exposed soil;
2. Restrict the size of active piles to the extent practicable;
3. Cover trucks used for material transport, use dust suppressant on material in trucks, or provide sufficient freeboard on trucks to reduce material escape during transport;
4. Prevent trucks and shovels from dumping material at excessive heights;
5. Maintain roadways;
6. Sweep paved areas to remove deposited particulate matter;
7. Wash construction vehicles;
8. Route and schedule construction vehicles to reduce delays to traffic during peak travel times;
9. Require appropriate emission-control devices on all fossil fuel-fired construction equipment to reduce criteria pollutant emissions; and,
10. Implement measures to reduce vehicle and equipment idling.

Asbestos containing materials and other hazardous building materials including: lead-containing paints, polychlorinated biphenyl light ballasts, mercury vapor-containing fluorescent light tubes, and mercury halide lights may have been used in buildings that could be demolished during project construction. Appropriate measures would be taken to reduce the chance of airborne asbestos if there is any activity near or around buildings that have the potential to contain asbestos.

3.16.5 Avoidance, Minimization, and/or Mitigation Commitments Incorporated into the Preferred Alternative

ODOT makes the following additional commitments.

JTA Phase

There are no mitigation commitments exclusive to the JTA phase.

JTA Phase and Preferred Alternative Subsequent to Construction of the JTA Phase

- ODOT will cover stockpiles and apply water (or other dust suppressant material) to exposed soil;
- ODOT will restrict the size of active piles to the extent practicable;
- ODOT will cover trucks used for material transport or use dust suppressant on material in trucks to reduce material escape during transport;
- ODOT will prevent trucks and shovels from dumping material at excessive heights;
- ODOT will maintain roadways;
- ODOT will sweep paved areas to remove deposited particulate matter;
- ODOT will wash construction vehicles;
- ODOT will route and schedule construction vehicles to reduce delays to traffic during peak travel times; and
- ODOT will take appropriate measures to reduce the chance of airborne asbestos if there is any activity near or around buildings that have the potential to contain asbestos.

Preferred Alternative Subsequent to Construction of the JTA Phase

There are no mitigation commitments exclusive to the Preferred Alternative.

Section 3.17 Content

- 3.17.1 Regulatory Setting
 - 3.17.1.1 FHWA Noise Regulation
 - 3.17.1.2 ODOT Noise Policy
 - 3.17.1.3 Oregon Department of Environmental Quality Noise Policy
 - 3.17.1.4 Local Noise Policy
 - 3.17.1.5 Project Noise Abatement Requirements
 - 3.17.1.6 Area of Potential Impact
- 3.17.2 Affected Environment
 - 3.17.2.1 Existing Land Use and Zoning
 - 3.17.2.2 Existing Noise Levels in Noise Sensitive Areas
- 3.17.3 Environmental Consequences
 - 3.17.3.1 Design Year 2035 Noise Levels and Impacts
 - 3.17.3.2 Evaluation of Noise Abatement Measures
 - 3.17.3.3 Construction Impacts
- 3.17.4 Avoidance, Minimization, and/or Abatement Measures
 - 3.17.4.1 Direct Impacts
 - 3.17.4.2 Construction Impacts
 - 3.17.4.3 Information for Local Officials
- 3.17.5 Avoidance, Minimization, and/or Mitigation Commitments Incorporated Into the Preferred Alternative

3.17 Noise

The purpose of this traffic noise analysis is to identify and document potential noise impacts associated with the proposed alternatives and to identify feasible and reasonable abatement. Existing noise levels were determined at various noise sensitive locations along the project right-of-way. Future (2035) noise levels were estimated for the No Build Alternative and modeled for the build alternatives using standard FHWA and ODOT methodologies. These predicted levels were compared to the existing noise conditions and evaluated for potential impacts as defined by FHWA and ODOT criteria.

3.17.1 Regulatory Setting

NEPA provides a regulatory framework that promotes the general welfare and fosters a healthy environment for noise considerations. There are both federal and state procedures for analyzing and abating highway traffic noise impacts in Oregon.

3.17.1.1 FHWA Noise Regulation

The FHWA noise regulation is contained within the Code of Federal Regulations, Title 23, Part 772 which provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and federal-aid highway projects. The proposed project is a Type I project as defined by the FHWA in 23 CFR 772.5.

Under 23 CFR 772.13, noise abatement must be considered for Type I projects if the project is predicted to result in a traffic noise impact. In such cases, the project must consider noise abatement before adoption of the final NEPA document. This process involves identification of noise abatement measures that are reasonable, feasible, and likely to be incorporated into the project, and identification of noise impacts for which no apparent solution is available.

Traffic noise impacts occur when predicted noise levels for the 2035 design year approach or exceed the noise abatement criteria (NAC) specified in 23 CFR 772, or when predicted 2035 noise levels would create a substantial noise increase over existing noise levels. 23 CFR 772 does not specifically define values for “substantial increase” or “approach;” these values are quantified by ODOT, as described in the following section. FHWA and ODOT NAC are based on land use activity categories, as described in greater detail below.

Figure 3.17-1 lists the noise levels of common activities as a point of reference.

3.17.1.2 ODOT Noise Policy

The July 2011 ODOT Noise Manual is ODOT's FHWA-approved noise policy and provides guidance for analyzing highway traffic noise and the evaluating potential noise abatement measures. ODOT's noise policy includes current policies, procedures, and practices to be used by agencies that sponsor new construction or reconstruction of federal or federal-aid highway projects. ODOT's noise policy states that a sound level is considered to approach the NAC level when the sound level is 2 dBA less than the NAC identified in 23 CFR 772. ODOT's noise policy defines a noise increase as "substantial" when the predicted traffic noise levels would exceed existing noise levels by 10 dBA. ODOT's noise policy provides detailed technical guidance for the evaluation of highway traffic noise, including field measurement methods, noise modeling methods, and report preparation guidance. Table 3.17-1 below provides the ODOT implementation of the FHWA NAC.

dBA is an A-weighted decibel, a unit of measurement for traffic noise. The A frequency weighting scale closely represents the average human hearing response.

The Equivalent Sound Level (Leq), the energy-average decibel level (usually in the units of dBA) over a specified period of time, such as 1-hour, is a commonly-used community noise measurement.

Figure 3.17-1 Common Indoor and Outdoor Sound Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Jet Fly-over at 300m (1000 ft)	110	Rock Band
Gas Lawn Mower at 1 m (3 ft)	100	
Diesel Truck at 15 m (50 ft), at 80 km (50 mph)	90	Food Blender at 1 m (3 ft)
Noisy Urban Area, Daytime	80	Garbage Disposal at 1 m (3 ft)
Gas Lawn Mower, 30 m (100 ft)	70	Vacuum Cleaner at 3 m (10 ft)
Commercial Area		Normal Speech at 1 m (3 ft)
Heavy Traffic at 90 m (300 ft)	60	
Quiet Urban Daytime	50	Large Business Office
Quiet Urban Nighttime	40	Dishwasher Next Room
Quiet Suburban Nighttime	30	Theater, Large Conference Room (Background)
Quiet Rural Nighttime	20	Library
	10	Bedroom at Night, Concert Hall (Background)
	0	Broadcast/Recording Studio
Lowest Threshold of Human Hearing		Lowest Threshold of Human Hearing

Table 3.17-1 FHWA Noise Abatement Criteria and ODOT Noise Abatement Approach Criteria

Activity Category	Activity Criteria ¹ (Leq(h))		Evaluation Location	Land Use Activity Description
	FHWA NAC ²	ODOT NAAC ³		
A	57	55	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B⁴	67	65	Exterior	Residential.
C⁴	67	65	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	50	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E⁴	72	70	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	--	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	--	--	Undeveloped lands that are not permitted.

Source: Reproduced from Table 1, ODOT 2011.

¹ The Activity Criteria, in Leq(h), are values for impact determination only and are not design standards for noise abatement measures

² FHWA Noise Abatement Criteria

³ ODOT Noise Abatement Approach Criteria

⁴ Includes undeveloped lands permitted for this activity category

Note: As used in footnote 4 and in the description of land use activity G, "permitted" means that a development permit has been issued by the date the NEPA process for a project has been completed.

3.17.1.3 Oregon Department of Environmental Quality Noise Policy

The Oregon DEQ Chapter 340 Division 35 sets allowable noise levels for individual vehicles and for industrial and commercial vehicle uses. Maximum allowable noise levels for in-use vehicles in Oregon are determined by vehicle type, operating conditions, and model year. While construction noise impacts are considered, individual vehicle noise levels are not addressed in this DEIS.

The FHWA Noise Abatement Criteria (NAC) are noise levels specified in 23 CFR 772 that define a noise impact for certain activities or land use categories.

The ODOT Noise Abatement Approach Criteria (NAAC) are noise levels for abatement consideration for noise sensitive receivers. The NAAC are 2 dBA less than the FHWA NAC.

3.17.1.4 Local Noise Policy

Medford has a local noise ordinance (Municipal Code Section 10.752 through Section 10.761) which includes noise limits for a variety of private, commercial, and industrial activities. However, Section 10.760 (Exemptions) includes specific exemptions for: (3) Sounds generated by tires and motor used to propel any road vehicle complying with the noise standards for individual vehicles, and (7) Sounds that originate on construction sites. Therefore, the construction or operation of the proposed project is not regulated by the local noise ordinance.

3.17.1.5 Project Noise Abatement Requirements

ODOT policy defines a traffic noise impact as either:

- When the future predicted traffic noise level is equal to or exceeds the Oregon NAAC (an "Approach or Exceed" noise impact), or
- When the future predicted traffic noise level creates a substantial increase of 10 dBA over existing noise levels (a "Substantial Increase" noise impact).

According to ODOT noise policy, once a noise impact has been identified, feasible and reasonable noise abatement measures must be considered. For noise abatement, primary consideration is given to exterior areas where frequent human use occurs.

Feasibility Requirements

When noise barriers are considered, a preliminary noise barrier design analysis must show that the barrier is feasible in terms of safety, property and emergency access, drainage control, overhead and underground utilities clearance, and other engineering and construction issues. Noise barriers must provide at least 5 dBA of noise reduction for a majority of impacted receptors to be considered feasible.

Reasonableness Requirements

Noise barrier reasonableness is related to performance and cost effectiveness. ODOT policy defines barrier cost effectiveness as the cost per benefited residence. A reasonable cost is typically up to \$25,000 per benefited residence. Some "Optional Reasonableness Criteria" may permit the allowable cost effectiveness value to increase up to \$35,000 per benefited residence. Noise Barriers must also provide 7 dBA of noise reduction for at least one benefited receptor. In addition to meeting noise reduction and cost requirements, proposed noise barriers must also be accepted by a majority of benefited residents and owners.

A **Receiver** is a modeling or measurement location that represents a noise sensitive land use and may represent multiple **receptors** or equivalent units.

A **Receptor** is a subset of a **receiver**. It is an activity or unit, such as one dwelling, represented by a measured or modeled receiver (which can include multiple units). A receptor is also called an **equivalent unit**.

A **Feasible Noise Abatement Measure** is one that has been determined to be effective at lowering noise levels, is possible to construct based on acoustical and engineering factors, and which provides a minimum of 5 dBA noise reductions for a majority of impacted receptors.

In Oregon, an **Impacted Receiver** is a receiver with a build alternative noise level that approaches (by 2 dBA or less) or exceeds the corresponding FHWA NAC. Oregon also calls this type of an impact an “absolute” or **Noise Abatement Approach Criteria (NAAC)** impact. A receiver can also be impacted when there is at least a 10 dBA increase for the build alternative scenario over existing noise levels (also called **Substantial Increase Impact**).

Reasonable Abatement is an abatement measure that has been determined to be:

- cost effective,
- approved by a simple majority of benefited property owners and residents, and
- able to achieve ODOT’s noise reduction design goal of 7 dBA.

3.17.1.6 Area of Potential Impact

The API for noise is defined as 500 feet from the edge of the proposed project. The extent of a noise study analysis area should include all receptors impacted by the project, but neither ODOT nor FHWA define the specific distance that must be used. Absolute noise impacts (those areas with noise levels approaching or exceeding the NAC of 65 dBA for residential land uses) rarely exist beyond 400 to 500 feet from the roadway. The noise analysis, through a combination of existing noise measurements and Traffic Noise Model (TNM) modeling, indicated that noise impacts for this project would not occur beyond 500 feet from the edge of the proposed project.

3.17.2 Affected Environment

3.17.2.1 Existing Land Use and Zoning

The existing land use, zoning, and comprehensive plan designation maps for the project area are presented in Section 3.2 (Figures 3.2-2 to 3.2-7). These figures show the generalized land uses for the primary area of potential effect for the land uses around the entire extent of the proposed project.

All properties located adjacent to the proposed project from I-5 to Commerce Drive are commercial, public recreation, or vacant land uses. The nearest residences in this area are located on the south side of existing OR 62 between Poplar Drive and Delta Waters Road. These include single- and multi-family residential uses. All of these residences are currently separated from existing OR 62 by either commercial or industrial structures, or public recreation or vacant land located along the south side of existing OR 62.

Land uses adjacent to the project between Commerce Drive and Vilas Road are vacant, public recreation, commercial, or industrial. Land uses adjacent to Justice Road and Peace Lane include public, vacant, commercial, and rural residential. These residences are located on both sides of Justice Road and Peace Lane, on the east and west sides of the project alignment. This area has the highest density of residential land uses in the API. In the area north of the rural residential area along Justice Road up to Lotus Lane, the majority of the land uses are commercial, farms, industrial, or open space. There are two urban residential lots on Dillon Way, the first street north of Justice Road on the east side of the proposed project right-of-way, and a few lots on the west side of the proposed project right-of-way which are zoned as rural residential or farm land.

Between Lotus Lane and E. Gregory Road, the proposed project right-of-way is bordered by commercial land uses, farm land, and rural residential land use. There are several residential land uses located on the east side of the existing OR 62 which are separated from the existing highway by a row of commercial and public land uses. Between E. Gregory Road and Leigh Way (OR 140), the proposed project right-of-way is bordered by commercial, wildlife reserve, public, and vacant land uses. Between Leigh Way and Antelope Road, the proposed project right-of-way is bordered by industrial, wildlife reserve, and vacant land uses.

For further information regarding traffic noise, including citations to source documents, refer to the *OR 62 Corridor Solutions Project Traffic Noise Technical Report*, December 2011. This report is available from the ODOT contact person identified on page i of this EIS.

Between Antelope Road and Dutton Road, the proposed project right-of-way is bordered by the VA SORCC (public land use), industrial, vacant, wildlife reserve, farm, and rural residential land uses. North of Dutton Road, the land uses adjacent to the proposed project include rural residential, farm, and vacant.

3.17.2.2 Existing Noise Levels in Noise Sensitive Areas

Noise sensitive areas (NSAs) are potentially impacted noise sensitive land uses within the API. There are 19 identified NSAs in the API. Figure 3.17-2 is a map of the locations and boundaries of the 19 NSAs; Figures 3.17-3 through 3.17-16 are larger-scale maps of those NSAs. Areas not included in identified NSAs were not specifically evaluated for noise impacts because those areas did not include developed land uses or the developed land were not noise sensitive (NAC Categories G or F respectively). However, noise impact distances for undeveloped lands are reported in section 3.17.4 as an impact avoidance measure for future development.

Table 3.17-2 describes the 19 NSAs and lists their corresponding activity categories (see Table 3.17-1 for descriptions of activity categories), the ODOT noise abatement approach criteria (NAAC), and existing noise levels. As shown in Table 3.17-2, there are five NSAs that currently approach or exceed the NAC.

NSAs are areas with potentially impacted noise-sensitive activities, such as activity categories A, B, C, D or E. However, the identified NSAs generally exclude developed areas that are not noise sensitive (Category F) and undeveloped lands that are not permitted but could be developed at some time in the future (Category G). For this project, undeveloped lands generally consist of vacant or agricultural lands north of Vilas Road which are not part of an identified NSA. Noise impact distances for undeveloped lands are presented in Table 3.17-8.

Existing noise levels for NSAs were determined in one of two ways, either by using the FHWA TNM Version 2.5 (for areas close to roadways where existing traffic noise levels are dominant) or from short-term measurements (for areas further from roadways where traffic noise is not currently the dominant noise source). Those short-term measurements were conducted during daytime hours and lasted typically 15 minutes. Table 3.17-2 shows whether existing noise levels were determined with TNM or with noise measurements for each NSA. In cases where the existing noise level is listed as a range, the range indicates noise levels for all receiver sites within the NSA.

In addition to the TNM modeling and the short-term noise measurements, the analysis also included three long-term measurements lasting approximately 24 hours each. The long-term measurements were taken to determine whether there is a “worst case noise hour,” or a period during the day when noise levels are loudest. Those three long-term measurements showed that noise levels are higher during the day than at night (as expected), but that noise levels fluctuate throughout the day, typically within 2 to 3 dBA, and there is no particular hour when noise levels are worst. Based upon this analysis it was determined the short-term measurement taken between the hours of 6:00 AM and 10:00 PM would generally be representative of typical daytime noise levels.

The noise analysis included a total of 96 noise measurement/prediction locations representing 220 individual noise sensitive units. An accounting of land use type, prediction/measurement location, represented equivalent units, and range of existing noise levels for each of the 19 NSAs is presented in Table J-1 in Appendix J. Maps in Appendix J show the locations of all measurement and receiver locations.

A total of nine individual receptor units in NSAs 1, 5, 6, 16, and 19 already approach or exceed the NAC for existing conditions.

A noise sensitive area (NSA) is defined as a geographical area that includes a variety of individual noise sensitive receptor units (individual homes, apartment units, institution properties, etc.) which have a similar land use and noise environment, and if impacted, would likely be protected by a single noise abatement element, such as a noise barrier. While the use of NSAs is not a requirement of FHWA or ODOT policy, they are a useful method for organizing groups of potentially impacted receivers.

Table 3.17-2 Identified Noise Sensitive Areas (NSAs)

NSA ID	Description	Activity Category ^{1,2}	NAAC Leq (h)	Existing Noise Level Leq (h), dBA	Existing Noise Level Determination Method ⁴
NSA-01	Area west of existing I-5/OR 62 Interchange (western project area limit). NSA consists of the Bear Creek Greenway which includes a walking path, Railroad Park and a mobile home park.	C	65	63-68	TNM model
NSA-02	Area northeast of existing I-5/OR 62 Interchange bounded by existing OR 62 on the south and Hilton Road on the north. NSA includes hotels and restaurants.	E	70	49-67	TNM model
NSA-03	Area southeast of Medford Airport and existing OR 62, bounded by Hilton Rd. and Corona Ave. NSA consists of multi-family dwelling units (apartments or condos) separated from existing OR 62 by a 250-foot strip of retail commercial development.	B	65	52-55	TNM model
NSA-04	Area east of Medford Airport, bounded by Medco Haul Road (proposed bypass alignment) to the west, Cardinal Ave. to the north, and Delta Waters Road to the south. NSA consists of a mixed commercial development potentially including professional, medical, financial office buildings and a church.	C E	65 70	51	Measurement (Location ST-04)
NSA-05	Area south of Vilas Road, between Medco Haul Road (proposed alignment) and North Runway Drive. NSA consists of a mix of residential, commercial, and industrial (only residential is Cat. B, all others are F2).	B	65	64-65	TNM model
NSA-06	Area north of Vilas Road, between Peace Lane and Rainbow Drive. NSA consists of a mix of residential, commercial, and industrial (only residential is Cat. B, all others are F2).	B	65	45-71	TNM model
NSA-07	Area west of Table Rock Road, and south of West Vilas Road. NSA consists of a mix of residential, commercial, and industrial (only residential is Cat. B, all others are F).	B	65	61	TNM model
NSA-08 ³	Area east of Medco Haul Road (proposed bypass alignment, all options) at Justice Road. NSA consists of several SFRs on Justice Road.	B	65	53	Measurement (Location ST-08)
NSA-09 ³	Area west of Medco Haul Road (proposed bypass alignment) at Justice Road. NSA consists of SFRs on Justice Road west of alignment and vicinity.	B	65	53	Measurement (Location ST-08)
NSA-10	Area east of Medco Haul Road (proposed bypass alignment, Option C) north of Justice Road. NSA consists of several SFRs on east side Medco Haul Road.	B	65	49	Measurement (Location ST-09)
NSA-11	Area just north of Dillon Way, between Option A/B alignment and existing OR 62/Crater Lake Highway. Approximately four SFRs on this dead-end street.	B	65	49	Measurement (Location ST-11)
NSA-12 ³	Area west of Medco Haul Road (proposed Option C bypass alignment) between Justice Road to the south and Gregory Road to the north. NSA consists of approximately four SFRs on west side of Medco Haul Road west of alignment as well as a few SFRs further to the west on Peace Ln.	B	65	49	Measurement (Location ST-09)
NSA-13 ³	Area between Option A and C alignments along unnamed road west of Crater Lake Hwy/OR 62, approximately 0.7 miles north of Justice Road NSA includes two SFRs.	B	65	46	Measurement (Location ST-10)
NSA-14	Area between Option A/B alignment and existing Crater Hwy/OR 62 and just to the east of NSA 13, along unnamed road west of Crater Lake Hwy/OR 62 located approximately 0.7 miles north of Justice Road NSA is a mixed use industrial area but also includes two SFRs.	B	65	50	Measurement (Location ST-13)
NSA-15	Area west of Agate Road (proposed bypass alignment, all options) at E. Gregory Rd. NSA includes multiple SFRs on E Gregory Rd. west of Agate Rd.	B	65	52	Measurement (Location ST-12)
NSA-16	Mixed-use area east of existing Crater Lake Hwy/OR 62 from Hwy 140/Leigh Way on the north to Fowler Lane on the south. NSA includes several SFRs.	B	65	49-71	TNM model
NSA-17	Area east of Agate Road (proposed bypass alignment) at Leigh Way. NSA includes at least one SFR (south of Leigh) and a recently constructed new hotel (north of Leigh).	B E	65 70	51	TNM model
NSA-18	Area south of W Dutton Road (proposed bypass alignment) between existing Agate Road and OR 62. NSA contains VA facility with both residential and active sports areas.	B C	65 65	47	Measurement (Location ST-15)
NSA-19	Area east of existing OR 62 at W Dutton Road (northern project limit). NSA contains one or more SFRs just east of the intersection and further northeast along OR 62.	B	65	49-69	TNM model

Notes:

¹ Refer to Table 3.17-1 for descriptions of activity categories.

² Activity categories F and G are excluded from this table as these categories are not noise sensitive and do not have a corresponding noise abatement criterion.

³ For some NSAs that were in close proximity and which were judged to have a similar existing noise environment, one noise measurement was conducted to represent both NSAs. (such as NSAs 8 and 9, a few hundred feet apart on either side of the yet to be constructed highway, but otherwise in the same existing neighborhood). SFR = Single Family Residence

⁴ Measurement locations noted in "Noise Level Determination" column are shown graphically in figures in Appendix J.

Figure 3.17-2

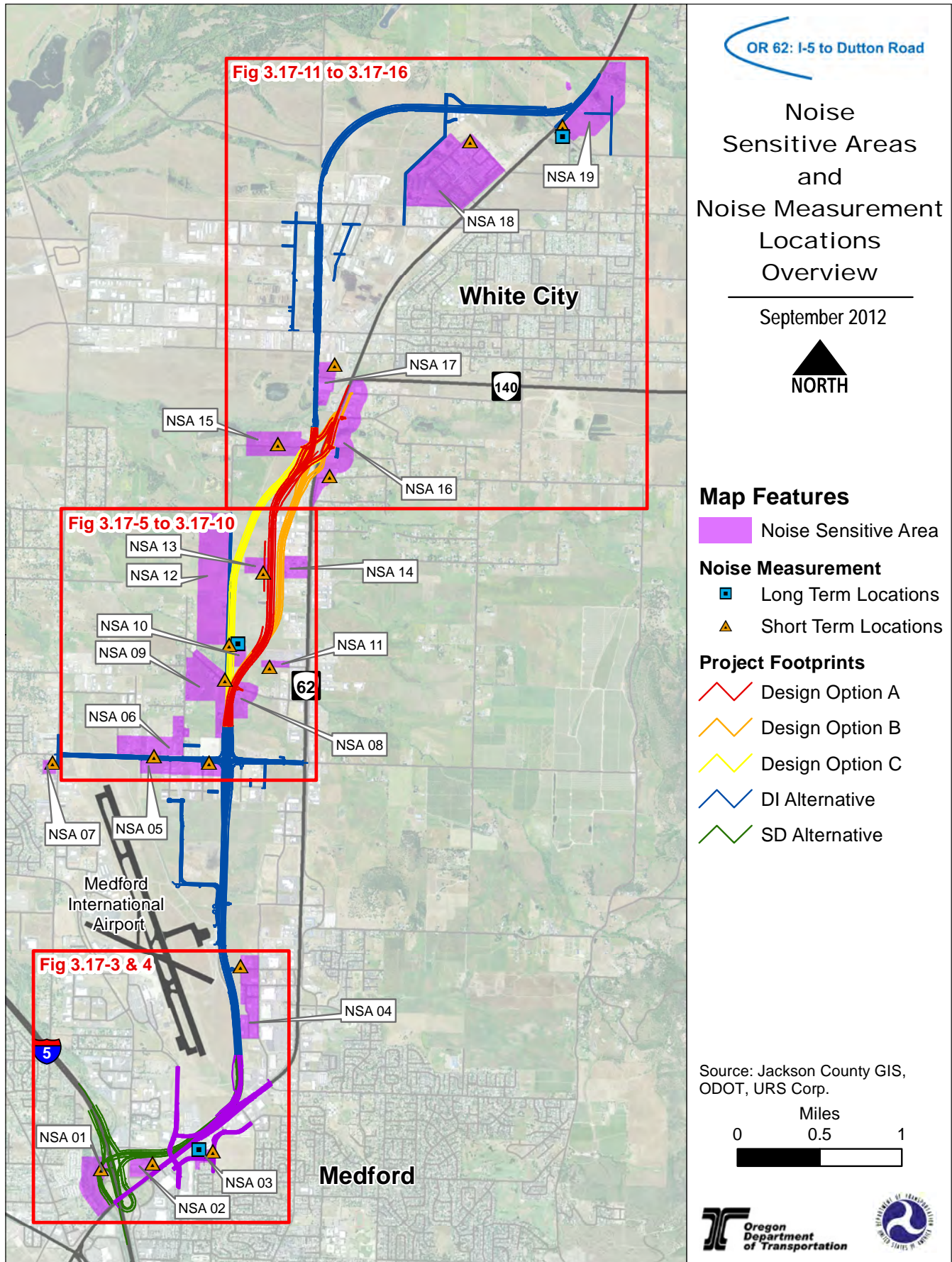
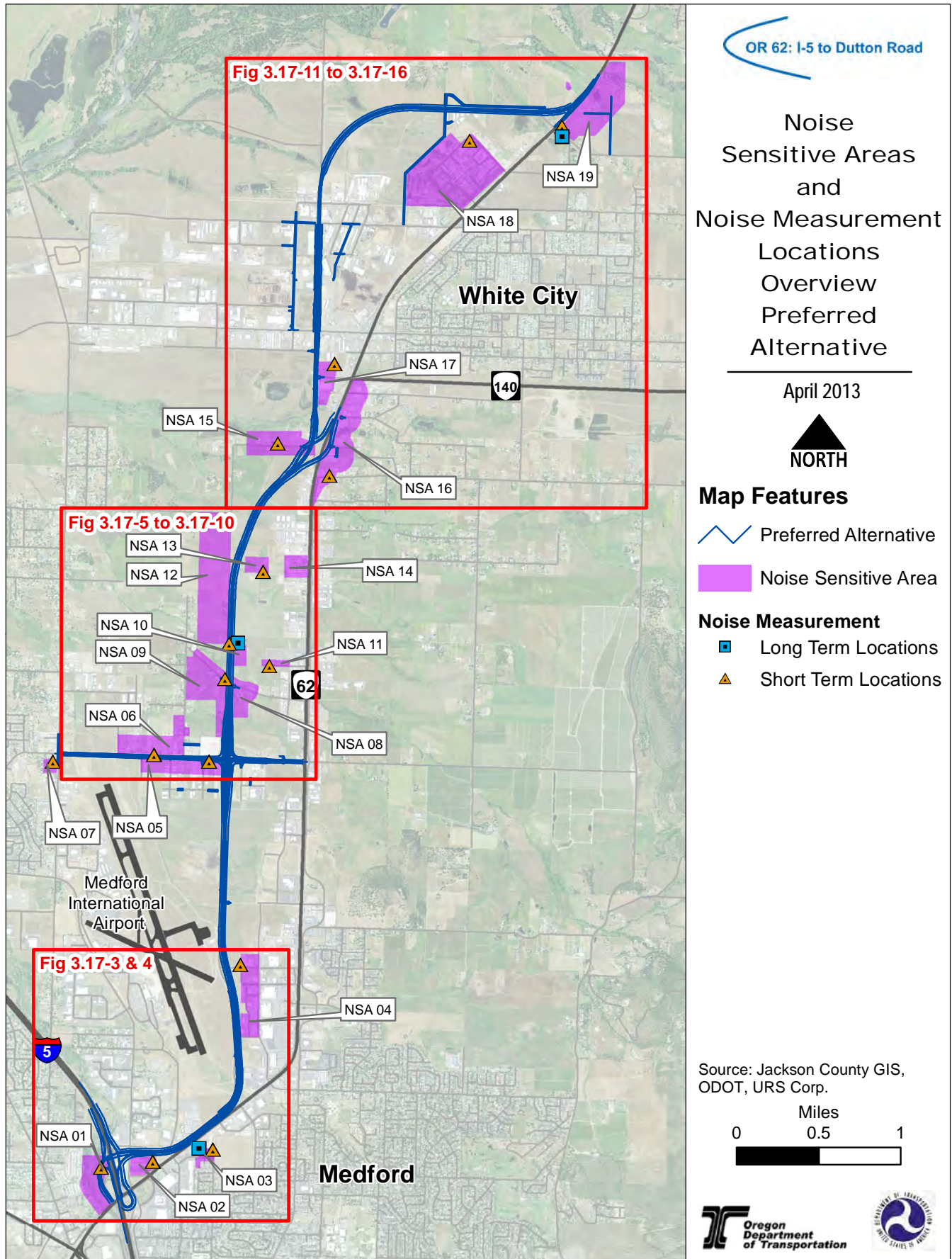


Figure 3.17-2 FEIS



3.17.3 Environmental Consequences

Noise levels were predicted for the year 2035 using the TNM Model. Predicted noise levels were based on the forecasted peak-hour traffic volumes and speeds for 2035 and assumed worst-case hourly equivalent noise levels (1-hour Leq, dBA). TNM noise model runs were validated by comparing measured existing noise levels to modeled existing noise levels in NSAs 1, 2, 5, 6 and 19 where traffic noise is the dominant existing noise source. For these NSAs the difference between measured and predicted existing noise levels were all less than 3 dBA, which is considered valid under ODOT's Noise Policy. Please refer to the Traffic Noise Technical Report for additional details on noise model validation. The Traffic Noise Technical Report is available from the ODOT contact person identified on page i of this DEIS.

Because the design changes that have occurred since the publication of the DEIS are limited to removal of some local roadways from the project, the noise analysis included in the DEIS already captures all expected noise impacts. Therefore, the noise analysis was not updated for the FEIS. The difference in noise impact between the DEIS and the FEIS would be minimal.

3.17.3.1 Design Year 2035 Noise Levels and Impacts

Table 3.17-3 provides a summary of noise impacts by alternative and NSA. The main difference in the number of impacts is not so much between the SD and the DI Alternatives, but rather between Design Options A, B, and C. Under either the SD or the DI Alternative, Design Option B would have the fewest noise impacts (13 or 14 receptors, respectively) and Design Option C would have the greatest number of noise impacts (19 and 20 receptors, respectively).

Table 3.17-3 Total Number of Noise Impacts

NSA ID	SD Alternative			DI Alternative			JTA Phase		
	A	B	C	A	B	C	A	B	C
NSA-01	--	--	--	1	1	1	1	1	1
NSA-02	--	--	--	--	--	--	--	--	--
NSA-03	--	--	--	--	--	--	--	--	--
NSA-04	1	1	1	1	1	1	1	1	1
NSA-05	3	3	3	3	3	3	3	3	3
NSA-06	2	2	2	2	2	2	2	2	2
NSA-07	--	--	--	--	--	--	--	--	-
NSA-08	2	2	3	2	2	3	--	--	2
NSA-09	--	--	2	--	--	2	--	--	3
NSA-10	1	1	--	1	1	--	--	--	--
NSA-11	--	--	--	--	--	--	--	--	--
NSA-12	--	--	4	--	--	4	--	--	4
NSA-13	--	--	1	--	--	1	--	--	1
NSA-14	1	1	--	1	1	--	--	1	--
NSA-15	--	1	--	--	1	--	--	--	--
NSA-16	1	--	1	1	--	1	1	1	1
NSA-17	--	--	--	--	--	--	--	--	--
NSA-18	--	--	--	--	--	--	--	--	--
NSA-19	2	2	2	2	2	2	3	3	3
Total	13	13	19	14	14	20	11	12	21

Table 3.17-4 lists the highest predicted noise levels for the year 2035 for the No Build, SD, and DI Alternatives, by NSA. Table 3.17-5 provides the same information for the JTA phase. As described in Right-of-Way Section 3.3, there would be some displacements associated with the SD and DI Alternatives. Cases where all receptors within an NSA would be displaced are designated with a "--*" in the table. Without receptors, there would be no noise impact and no mitigation required. Tables J-3 through J-11 in Appendix J, present predicted noise levels and noise impacts for individual receivers for each alternative/design option combination.

Table 3.17-4 Highest Predicted 2035 Noise Levels (Leq, dBA)

NSA ID	NAAC Leq (h)	Existing Leq (h), dBA	No Build Alternative	SD Alternative			DI Alternative		
				A	B	C	A	B	C
NSA-01	65	63-68	69	--*	--*	--*	69	69	69
NSA-02	70	49-67	68	67	67	67	66	66	66
NSA-03	65	52-55	56	58	58	58	64	64	64
NSA-04	70	51	52	68	68	68	69	69	69
NSA-05	65	64-64	68	70	70	70	70	70	70
NSA-06	65	45-71	73	73	73	73	73	73	73
NSA-07	65	61	62	63	63	63	63	63	63
NSA-08	65	53	54	69	68	69	69	69	69
NSA-09	65	53	54	62	63	69	63	63	69
NSA-10	65	49	50	61	63	--*	61	63	--*
NSA-11	65	49	50	57	56	47	57	56	49
NSA-12	65	49	50	50	51	68	50	51	68
NSA-13	65	46	47	63	56	58	63	57	59
NSA-14	65	63	51	62	73	47	62	73	47
NSA-15	65	52	53	53	51	53	53	51	54
NSA-16	65	49-71	71	68	57	68	68	57	68
NSA-17	65	51	52	69	69	69	69	69	69
NSA-18	65	47	48	49	49	49	49	49	49
NSA-19	65	49-69	71	71	71	71	71	71	71

Notes:

*All receptors would be displaced under this alternative.

Impacted noise level shown in bold typeface

Source: Traffic Noise Technical Report

Noise impacts are classified as either "Approach or Exceed" or "Substantial Increase." An "Approach or Exceed" noise impact occurs when the future noise level is predicted to be greater than the ODOT NAAC, or within at least 2 dBA of the FHWA NAC. A "Substantial Increase" noise impact occurs when the predicted noise level is more than 10 dBA higher than the existing noise level. Table 3-17.6 provides a summary of the number of receptors (e.g., individual residences) that would experience "Approach or Exceed" or "Substantial Increase" impacts, by alternative. This table also includes the total number of receptors impacted by either or both of those impact types. Note that some receptors could experience both types of impacts; the total noise impacts counts impacted receptors only once. The table also includes the number of receptors that would be displaced by each alternative and are therefore not counted as noise impacts.

Figures 3.17-3 through 3.17-16 show the locations of impacted or displaced receptors, by alternative, design option, and JTA phase.

Figure 3.17-3

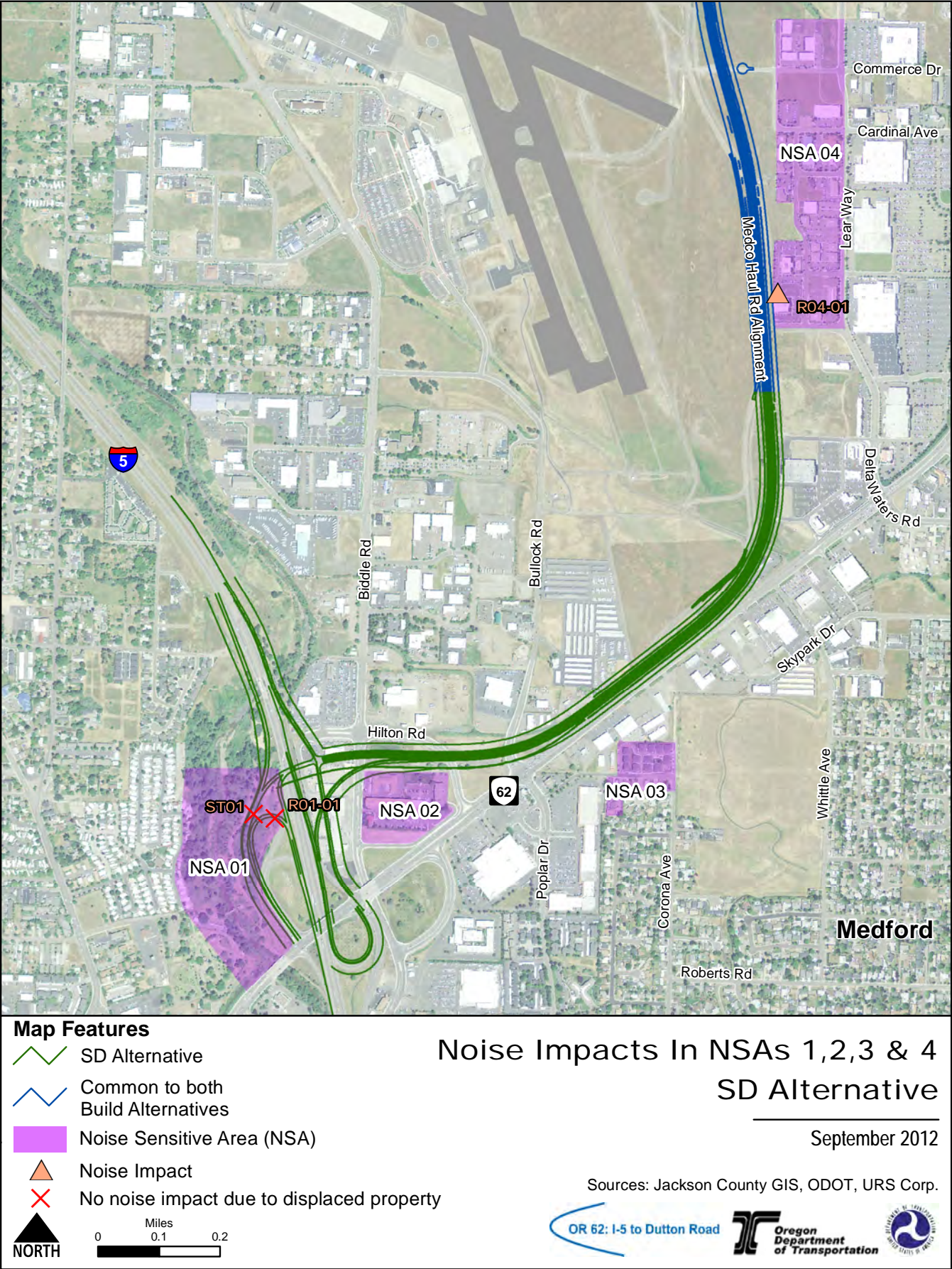


Figure 3.17-3 FEIS

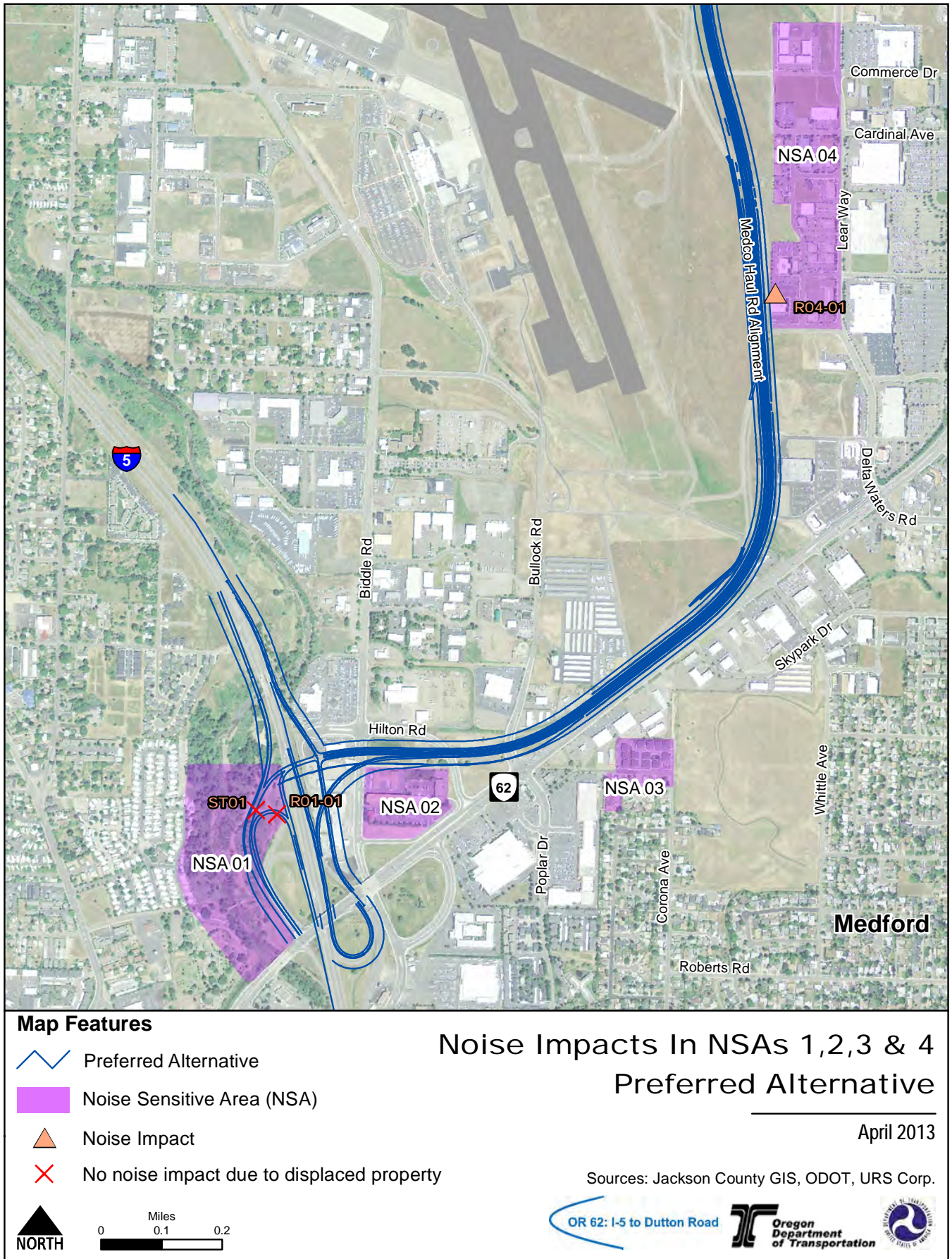


Figure 3.17-4

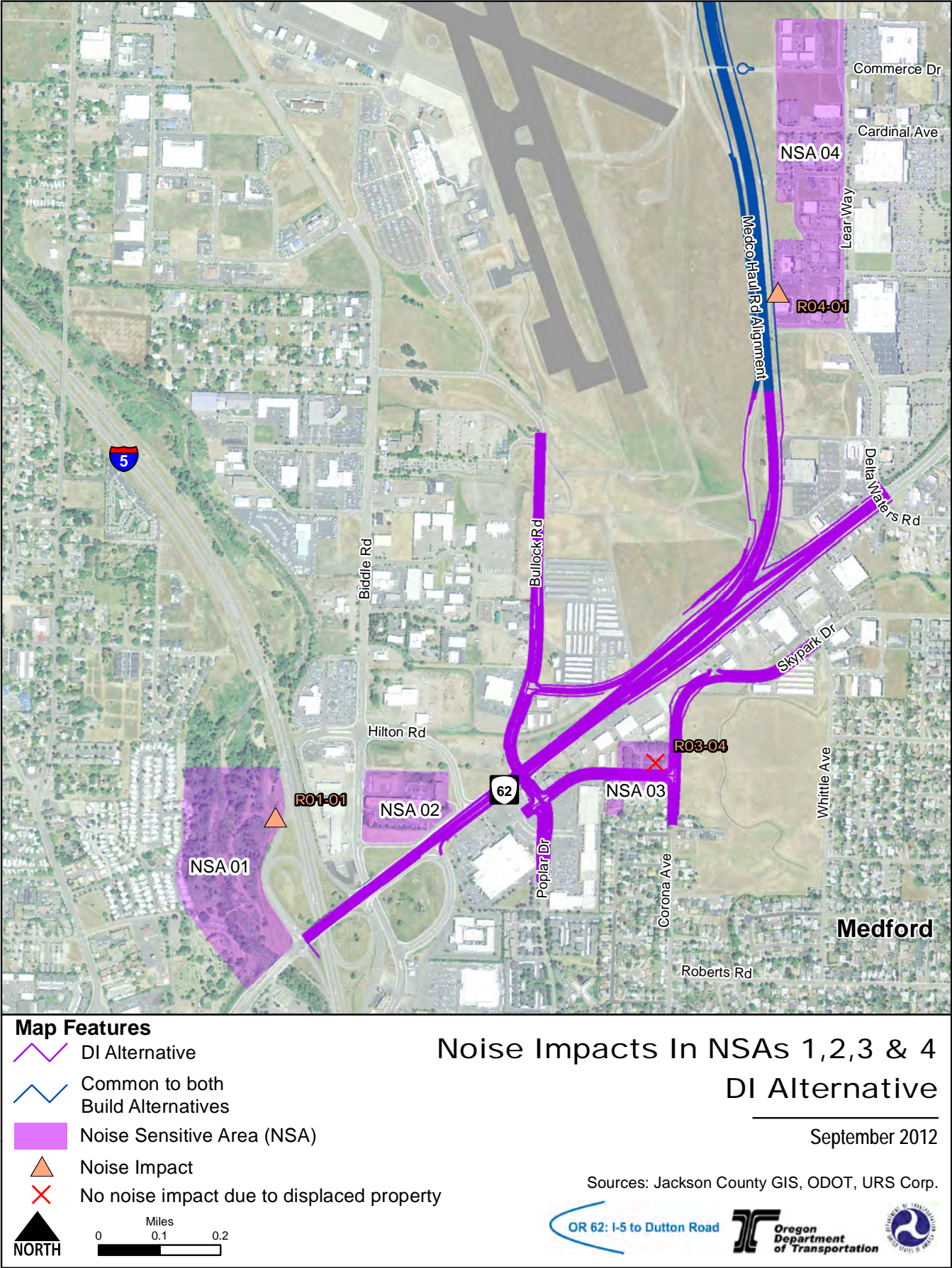
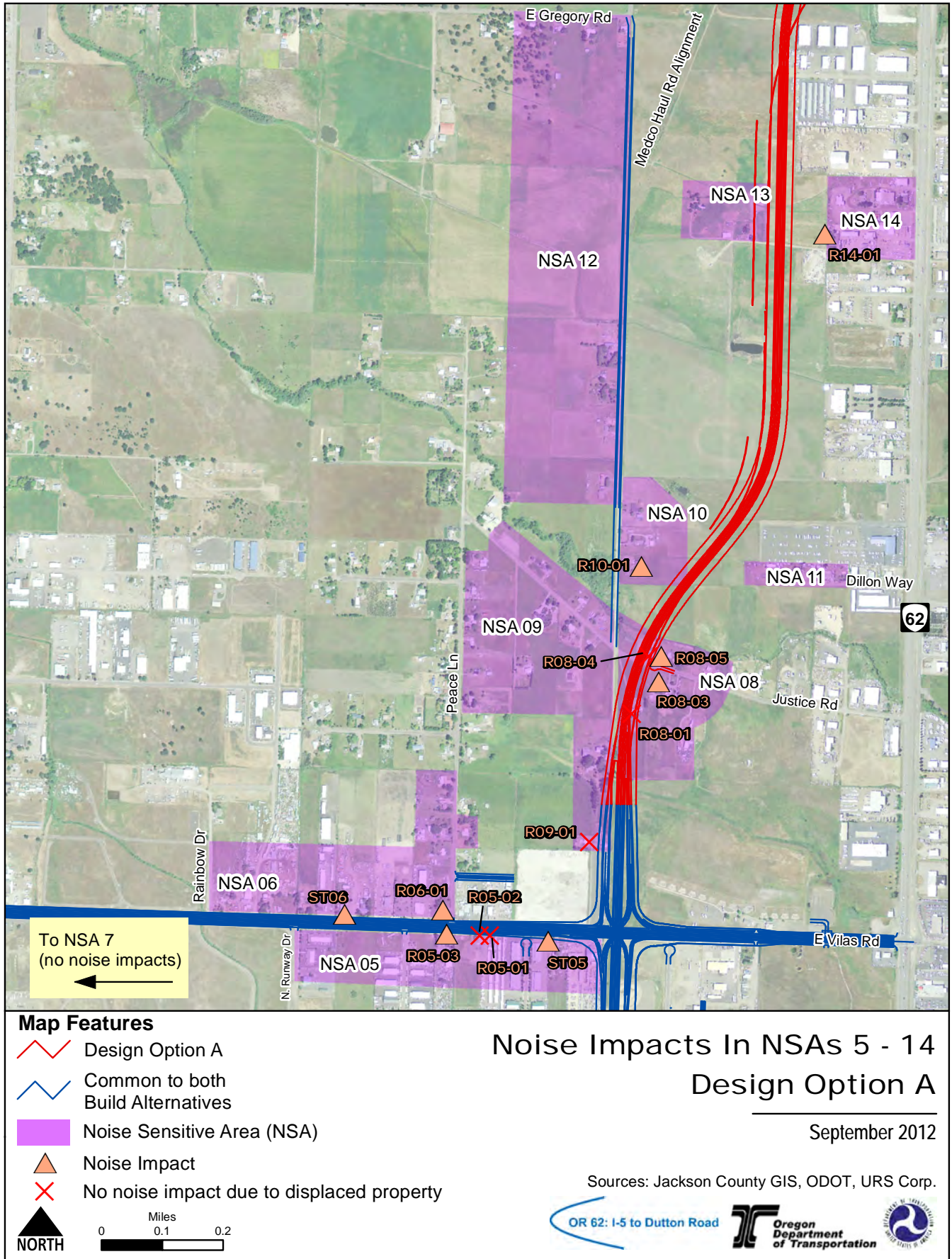


Figure 3.17-5



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Figure 3.17-6

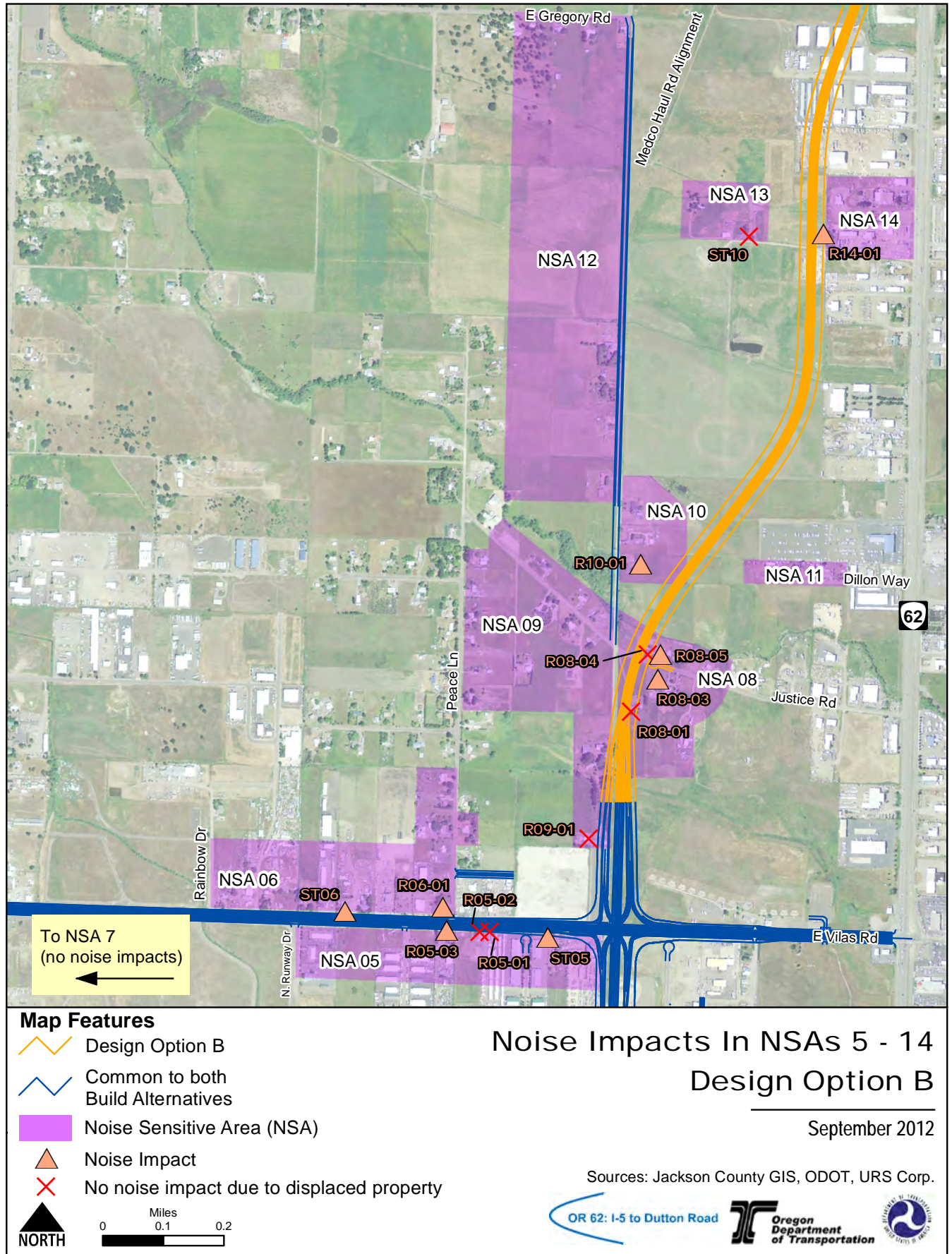


Figure 3.17-7

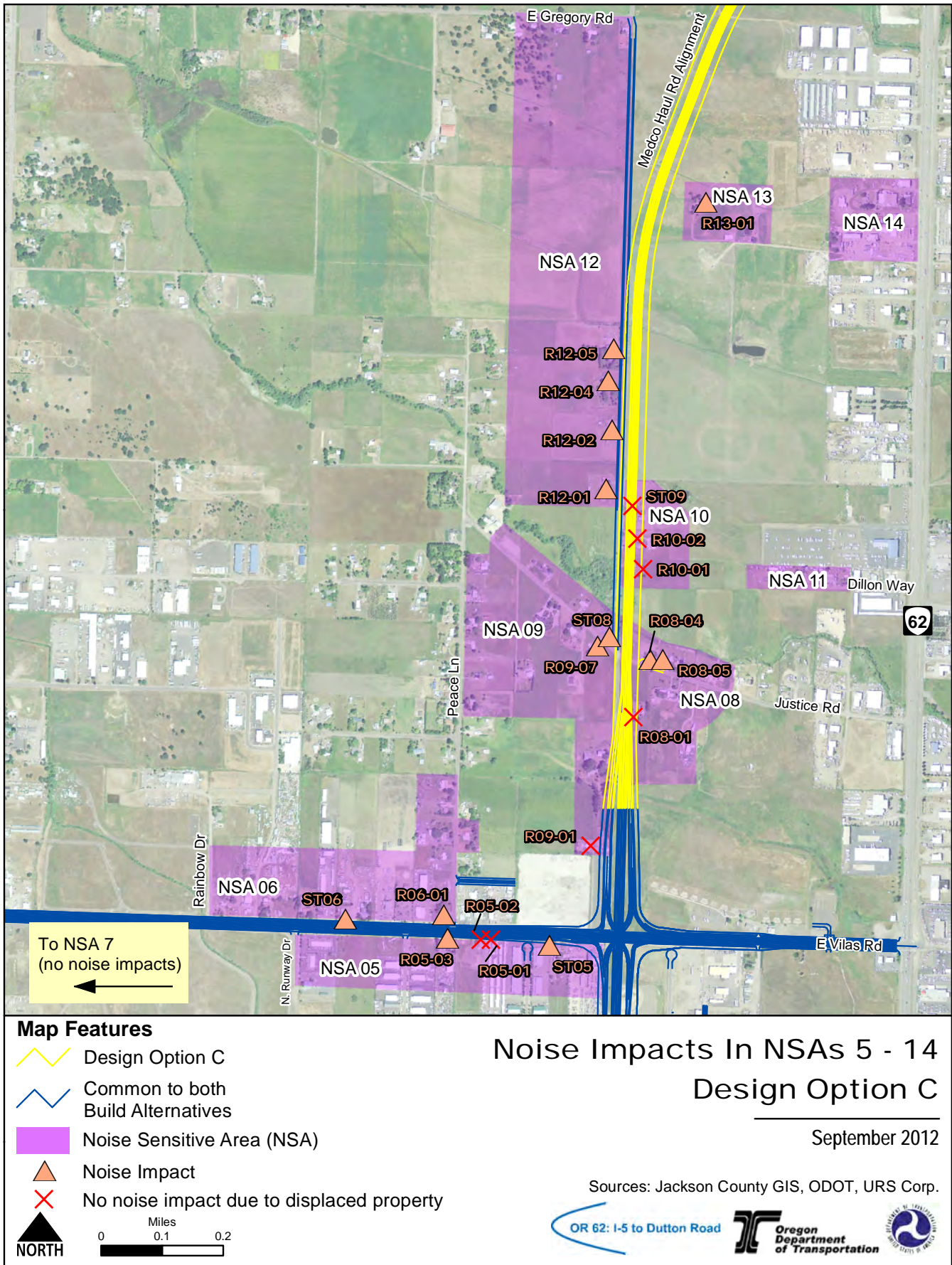


Figure 3.17-7 FEIS

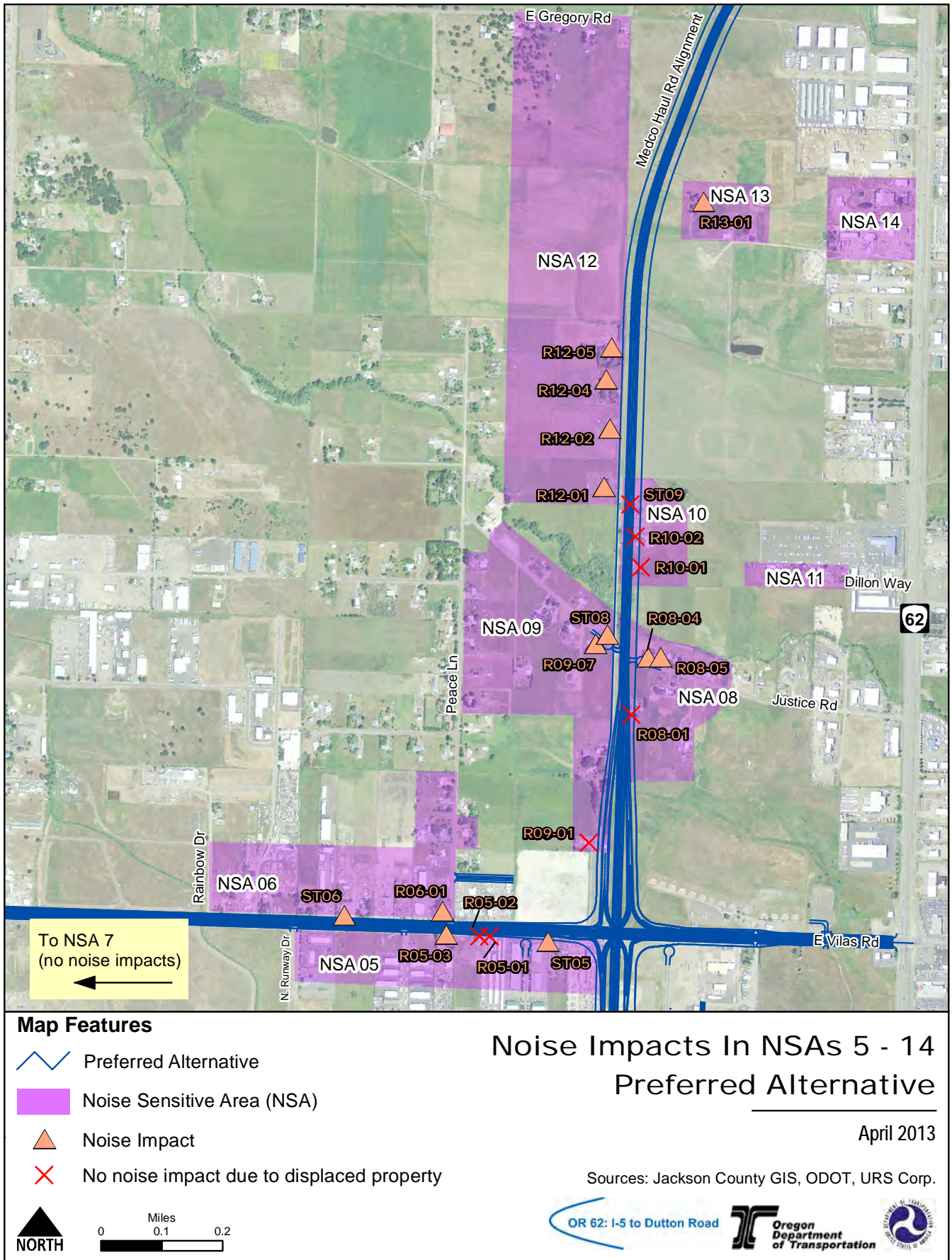


Figure 3.17-8

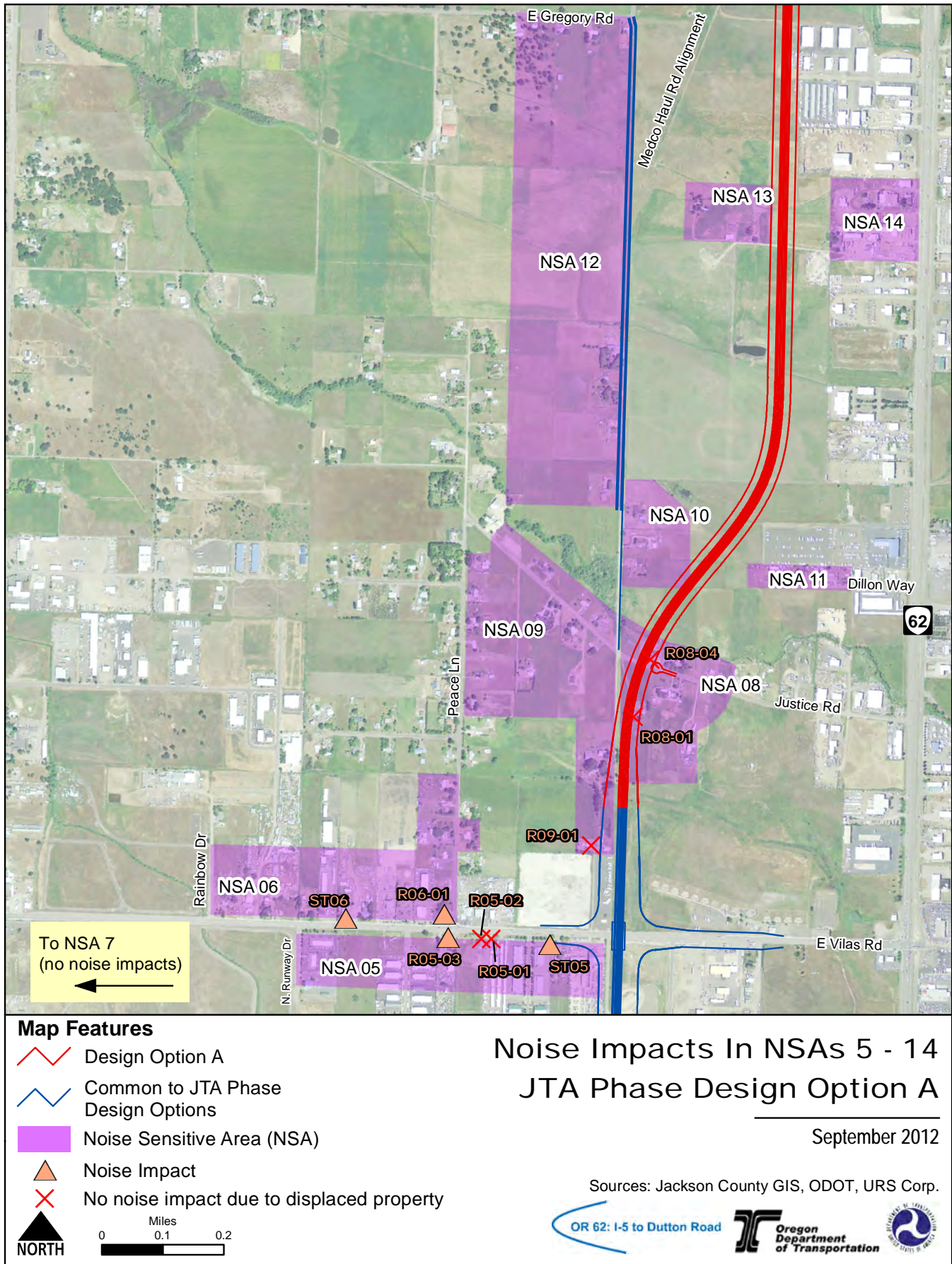


Figure 3.17-9

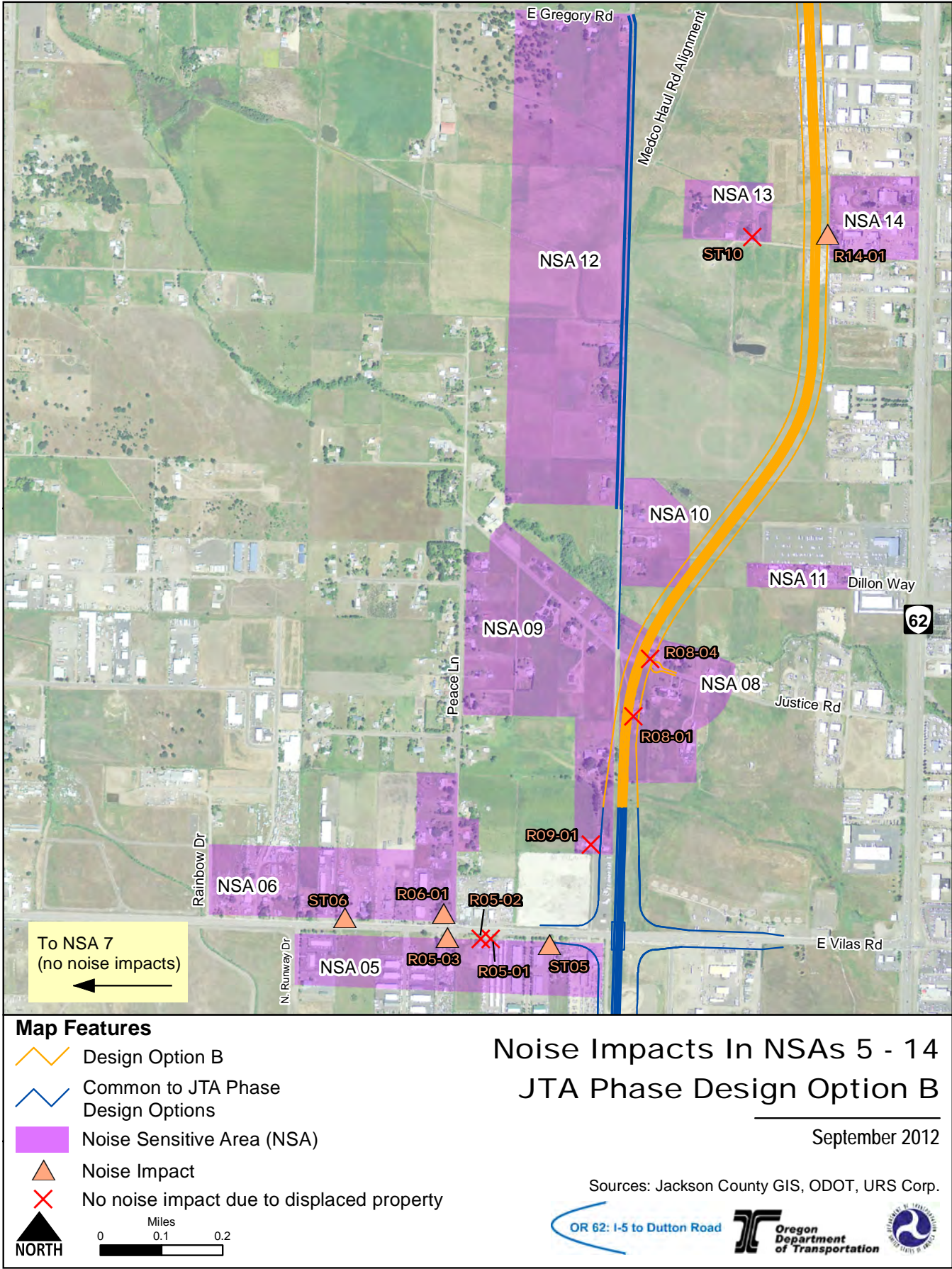


Figure 3.17-10

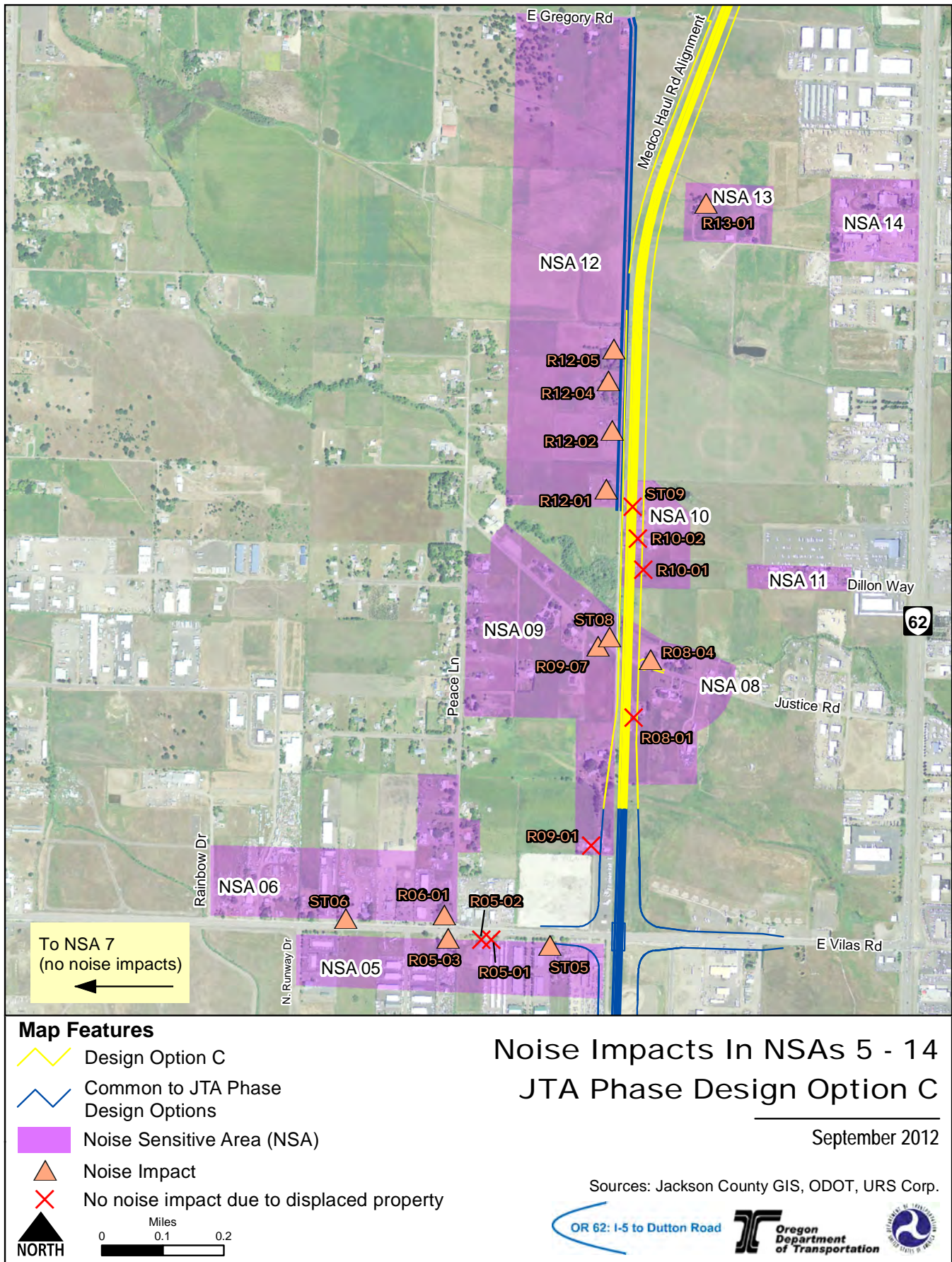
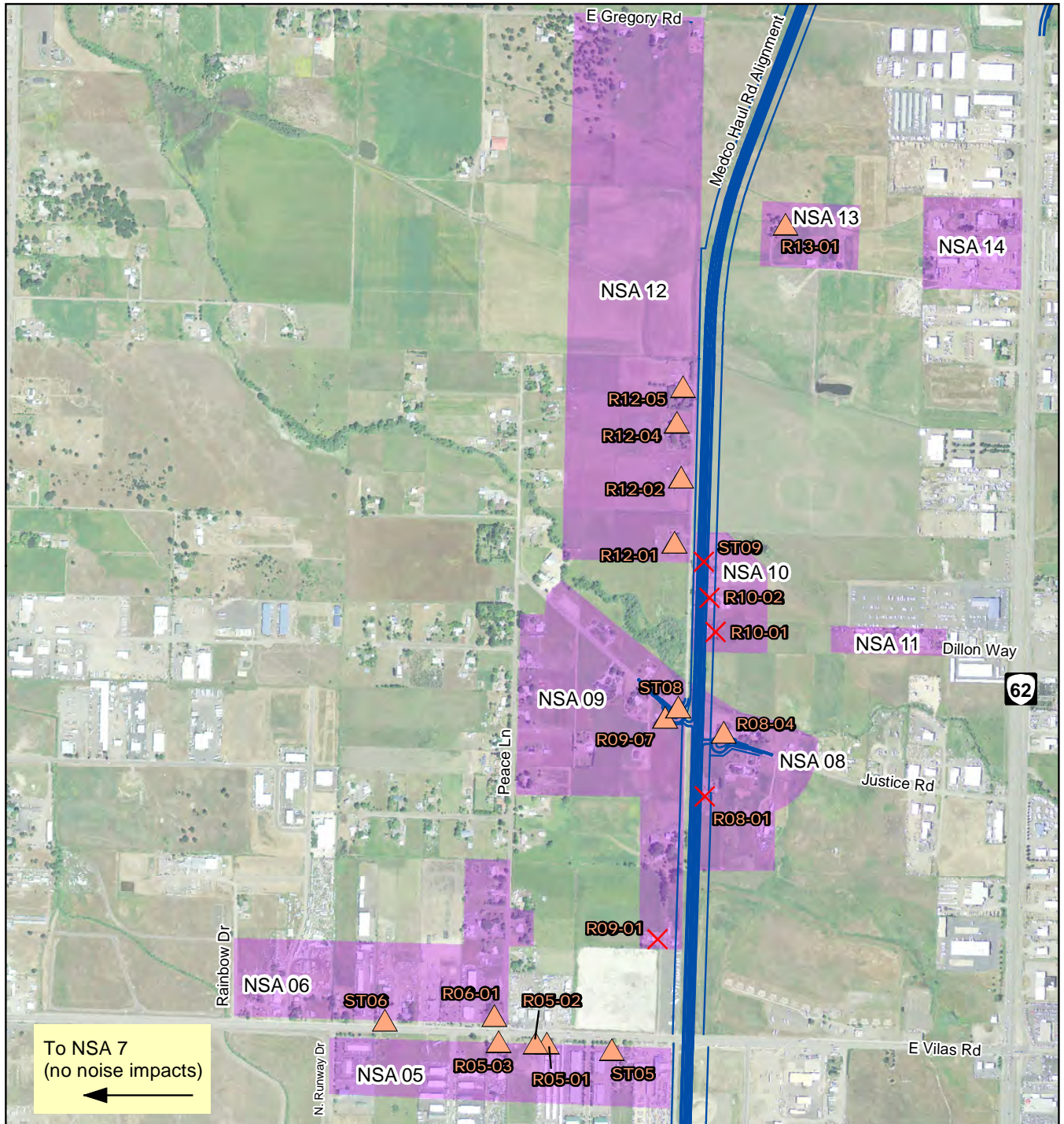






Figure 3.17-10 FEIS



Map Features

-  JTA Phase
-  Noise Sensitive Area (NSA)
-  Noise Impact
-  No noise impact due to displaced property



0 0.1 0.2
Miles

Noise Impacts In NSAs 5 - 14 JTA Phase

April 2013

Sources: Jackson County GIS, ODOT, URS Corp.



Figure 3.17-11

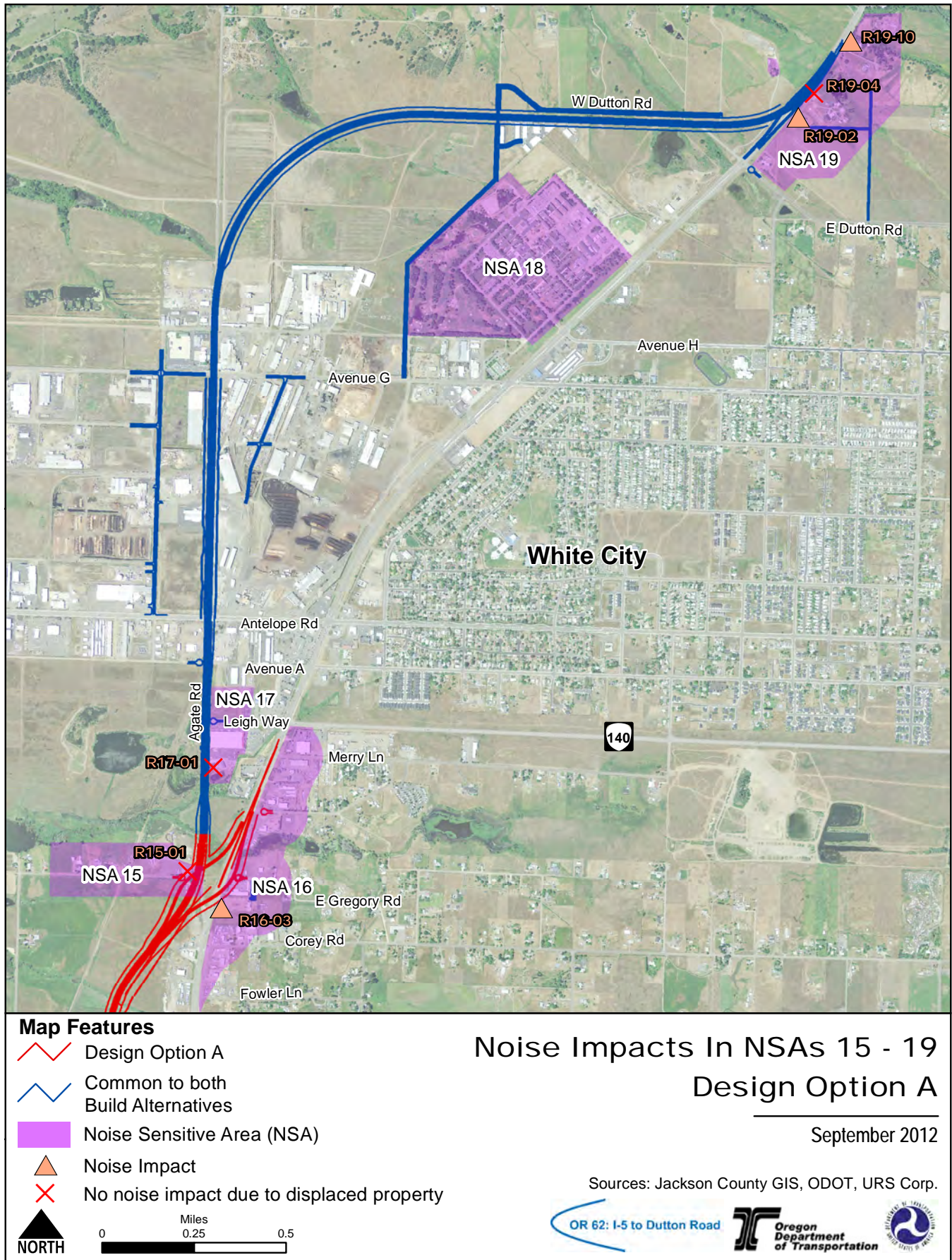


Figure 3.17-12

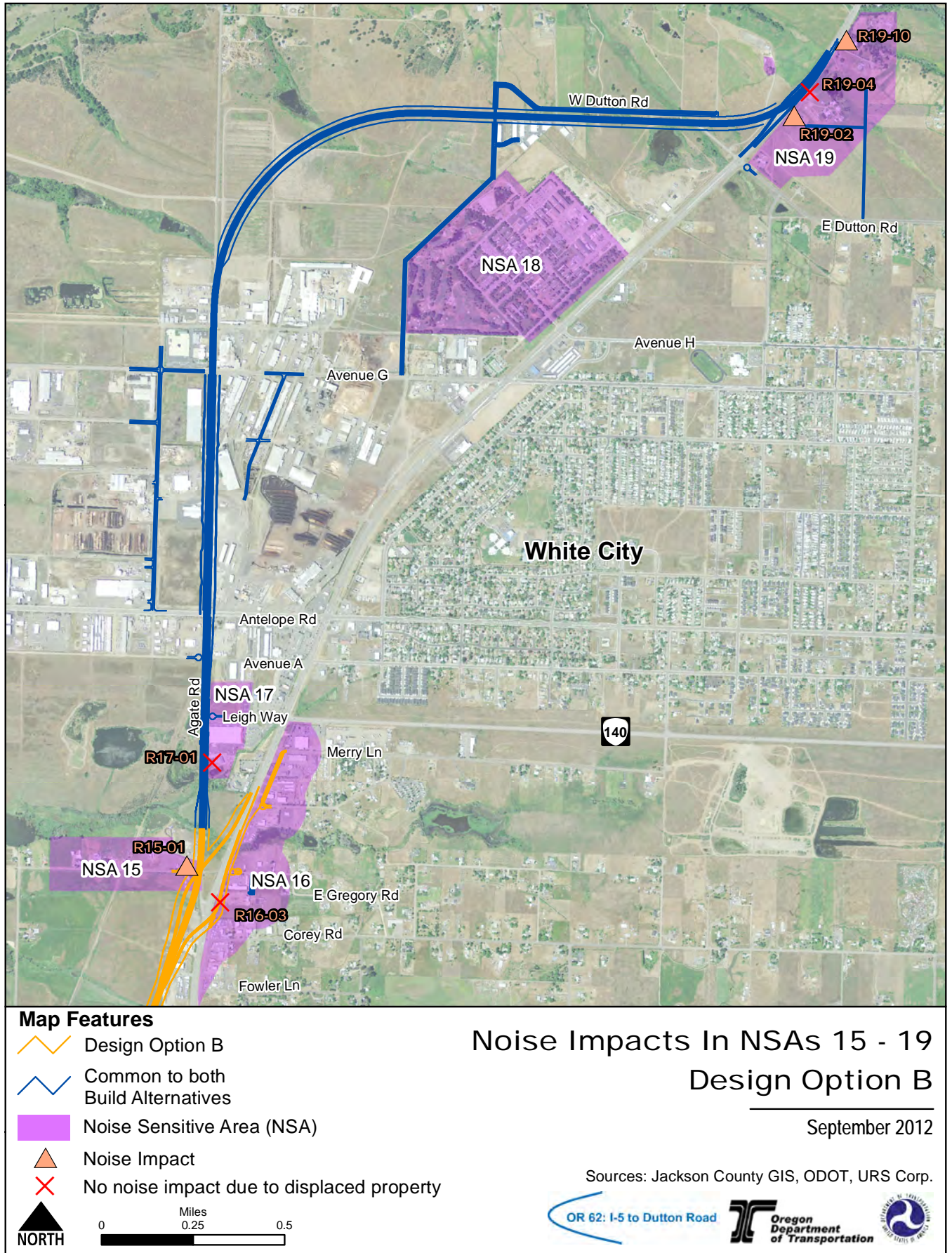


Figure 3.17-13

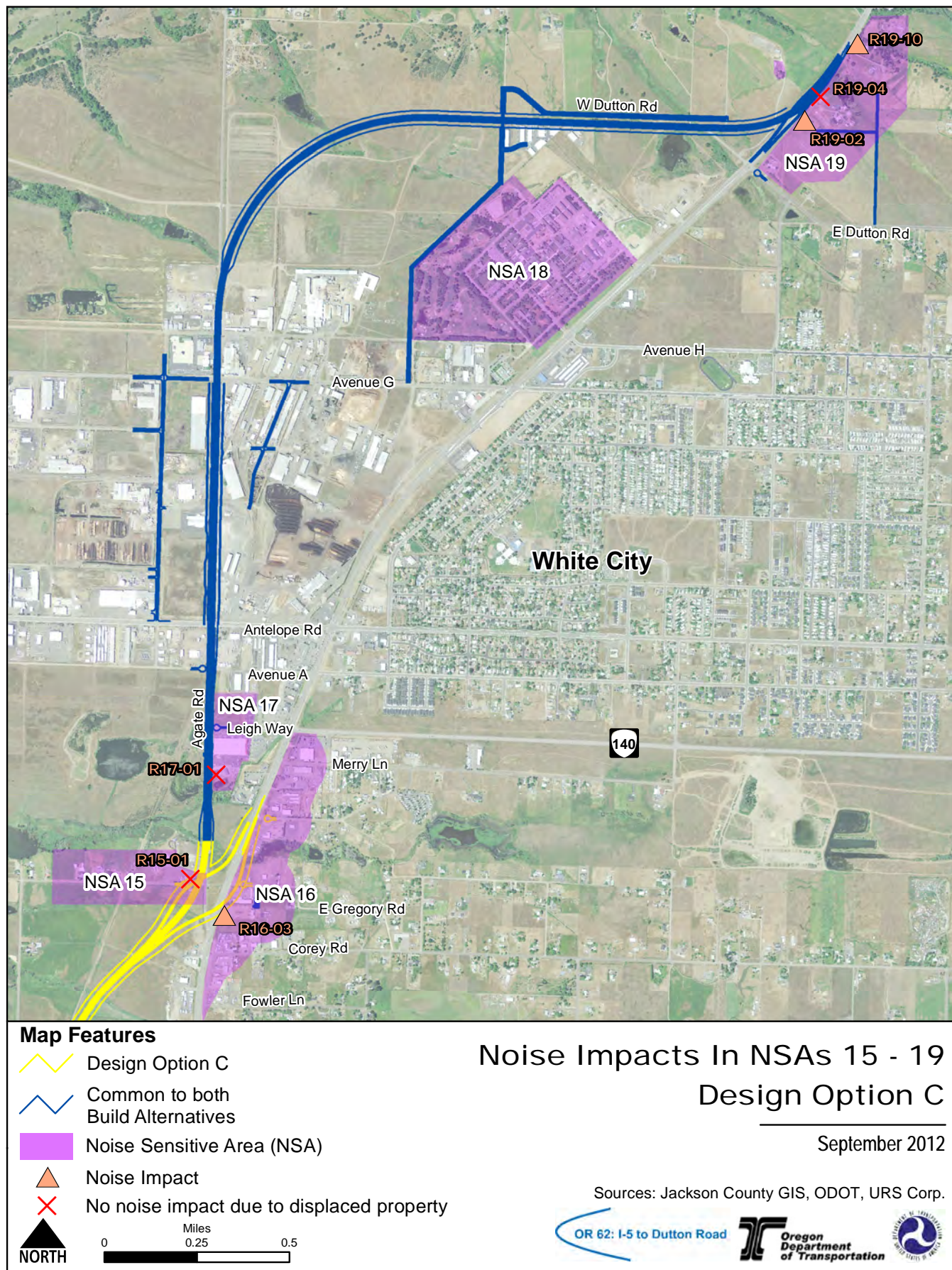
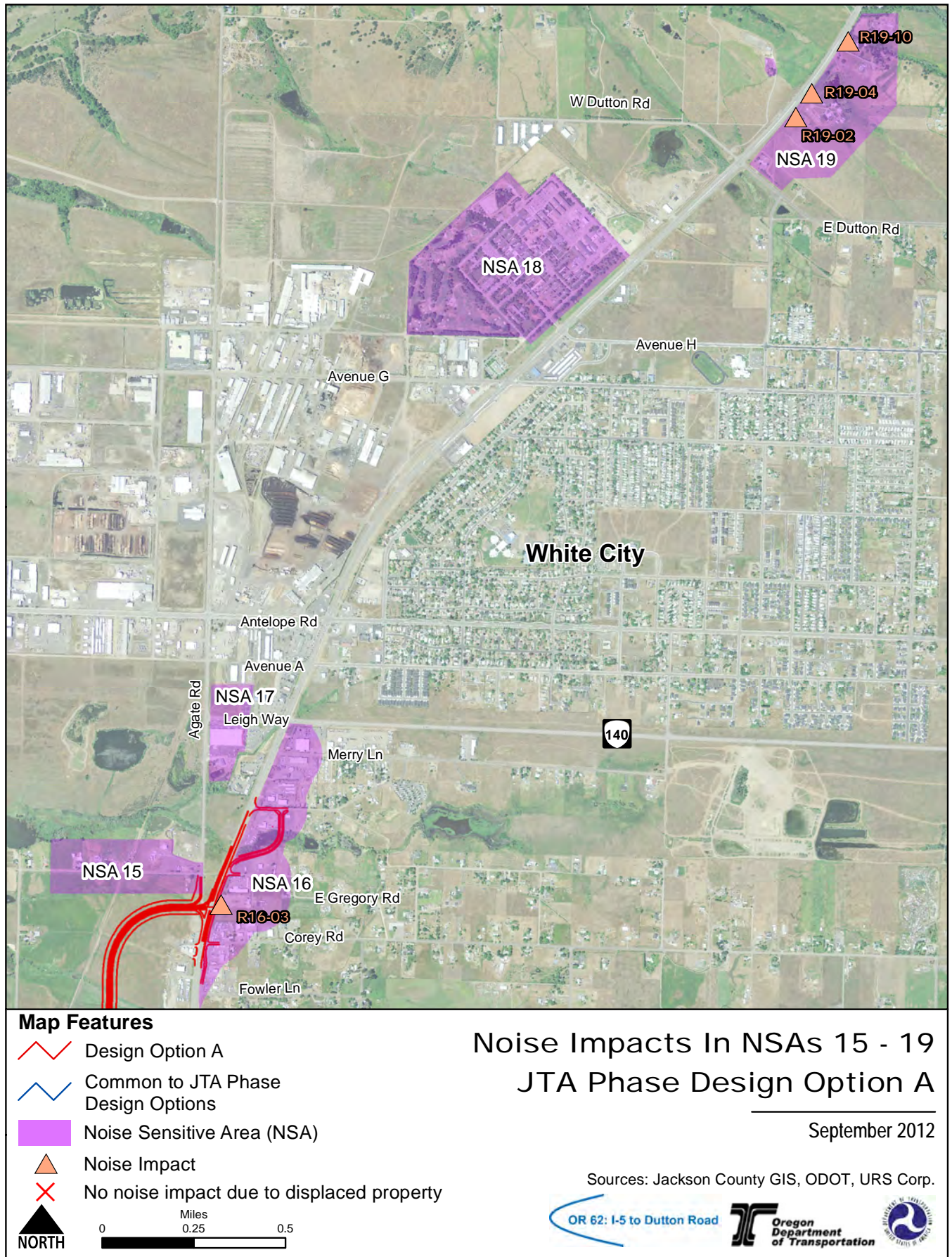


Figure 3.17-14



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Figure 3.17-15

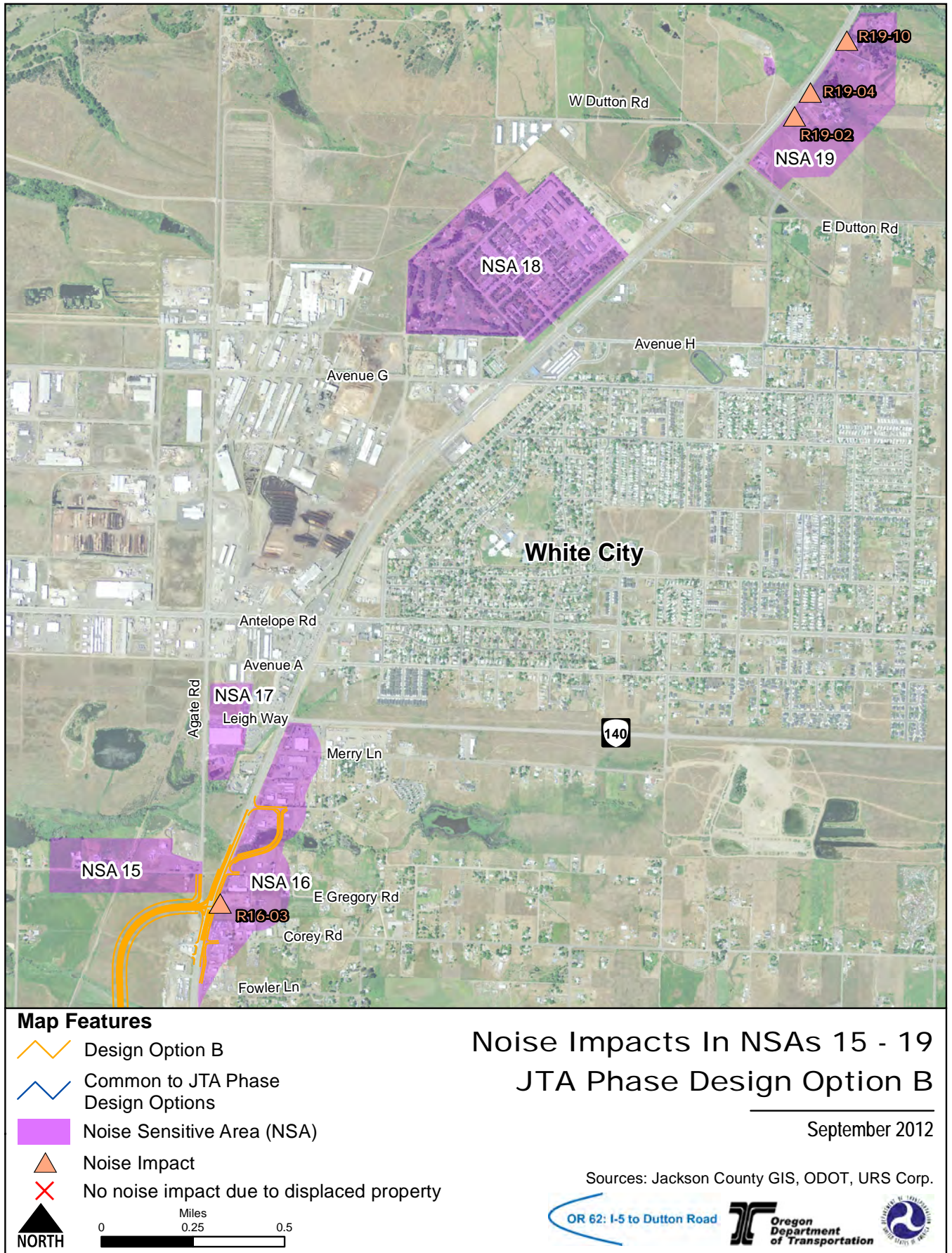


Figure 3.17-16

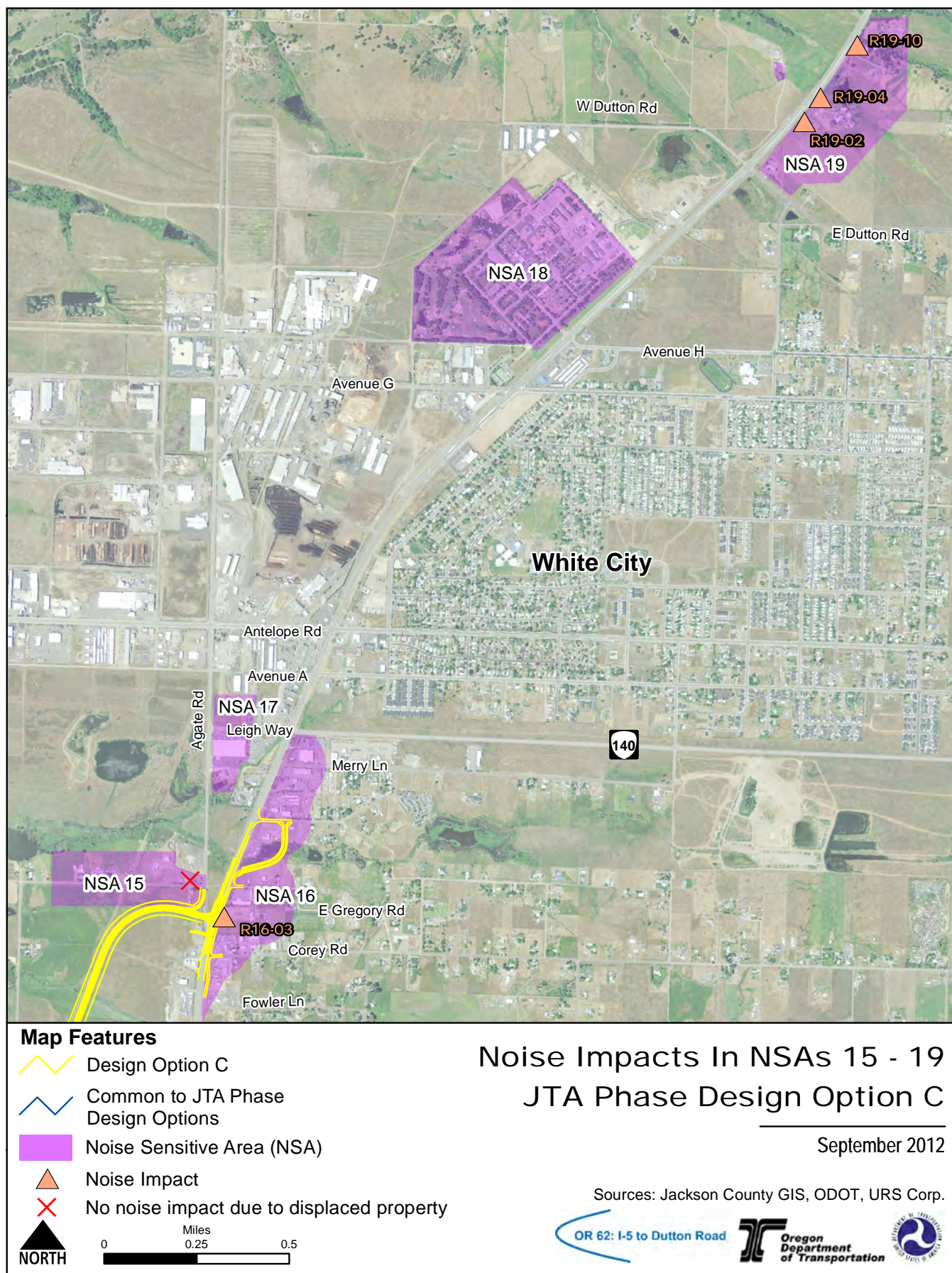


Figure 3.17-16 FEIS

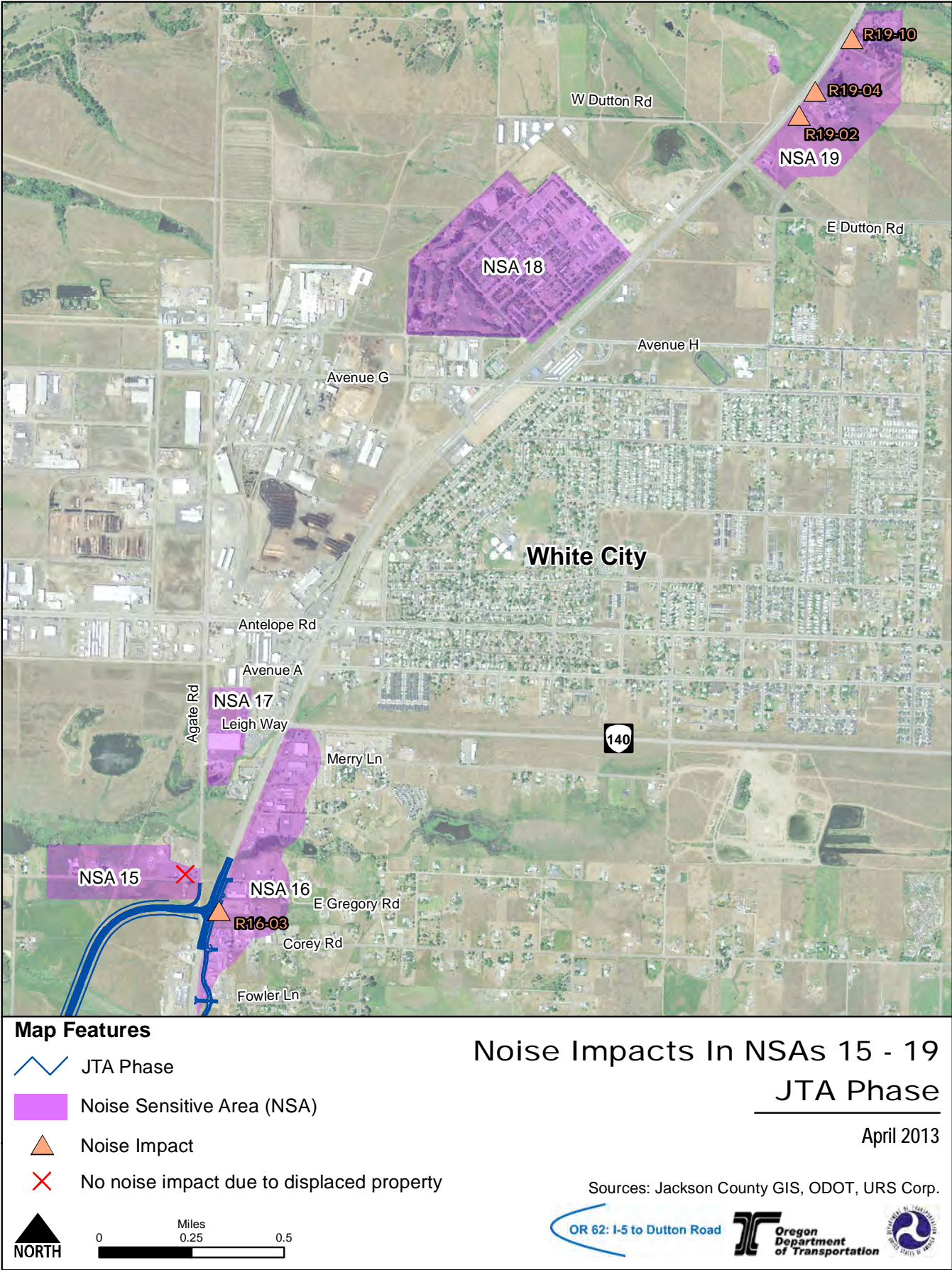


Table 3.17-5 Highest Predicted Future Noise Levels by JTA Phase Design Option (Leq, dBA)

NSA ID	NAAC	Existing Noise Level Leq (h), dBA	No Build	JTA Phase		
				A	B	C
NSA-01 ¹	65	63-68	69	69	69	69
NSA-02 ¹	70	49-67	68	68	68	68
NSA-03 ¹	65	52-55	56	56	56	56
NSA-04 ²	70	51	52	68	69	69
NSA-05 ¹	65	64-64	68	68	68	68
NSA-06 ¹	65	45-71	73	73	73	73
NSA-07 ¹	65	61	62	62	62	62
NSA-08 ²	65	53	54	61	60	65
NSA-09 ²	65	53	54	61	60	65
NSA-10 ²	65	49	50	56	55	--*
NSA-11 ²	65	49	50	55	53	46
NSA-12 ²	65	49	50	48	49	66
NSA-13 ²	65	46	47	62	54	57
NSA-14 ²	65	63	51	60	71	46
NSA-15 ²	65	52	53	57	56	56
NSA-16 ¹	65	49-71	71	71	71	71
NSA-17 ¹	65	51	52	52	52	52
NSA-18 ²	65	47	48	48	48	48
NSA-19 ¹	65	49-69	71	71	71	71

Notes:

Values representing potential impacts are shown in Bold + Italic in table

¹ TNM model used for estimation method.

² Actual measurements used for estimation method.

*All receptors would be displaced under this build alternative.

Source: Traffic Noise Technical Report

Table 3.17-6 Number of Properties Impacted by Project Traffic Noise

Impact Type	SD Alternative			DI Alternative			JTA Phase		
	A	B	C	A	B	C	A	B	C
Approach or Exceed									
Residential (Cat. B)	9	9	15	9	9	16	9	10	11
Non-Residential (Cat. C & E)	0	0	0	1	1	1	1	1	1
Total (Cat. B, C & E)	9	9	15	10	10	17	10	11	12
Substantial Increase									
Residential (Cat. B)	4	5	10	4	5	10	0	1	10
Non-Residential (Cat. C & E)	1	1	1	1	1	1	1	1	1
Total (Cat. B, C & E)	5	6	11	5	6	11	1	2	11
Potential Displacements (not counted as noise impacts)									
Residential (Cat. B)	9	9	11	69	69	71	6	6	9
Non-Residential (Cat. C & E)	2	2	2	0	0	0	0	0	0
Total (Cat. B, C & E)	11	11	13	69	69	71	6	6	9
Total Noise Impacts									
Residential (Cat. B)	12	12	18	12	12	18	9	10	19
Non-Residential (Cat. C & E)	1	1	1	2	2	2	2	2	2
Total (Cat. B, C & E)	13	13	19	14	14	20	11	12	21

3.17.3.2 Evaluation of Noise Abatement Measures

Noise abatement was considered for 13 noise-impacted NSAs. Table 3.17-7 lists which NSAs would experience noise impacts and a summary of the noise abatement analysis. ODOT noise abatement evaluation and recommendation analysis worksheets were completed for each NSA and are included in the Noise Technical Report.

Noise abatement was considered to be feasible if it achieved at least a 5 dBA reduction at a majority of impacted receptors, without restricting access. Abatement measures that were found to be feasible were then analyzed for cost effectiveness and reasonableness. For a single impacted receptor or other simple cases, a conceptual barrier analysis was conducted using simple height and length barrier design concepts. For more complex scenarios, preliminary barrier designs were evaluated using TNM models.

Noise abatement would be feasible (i.e., could sufficiently reduce noise levels) in nine of the 13 impacted NSAs, but not financially reasonable (i.e., they would all cost more than \$25,000 per benefitted residence) for any of the NSAs. Therefore, no abatement is recommended for any alternative. Since no abatement is being recommended, none of the impacts would be mitigated. The total number of unavoidable impacts would range from 11 to 21, depending on the build alternative, design option, and JTA phase design option as shown in Table 3.17-6.

Table 3.17-7 Noise Abatement Recommendation Summary by Impacted NSAs

Impacted NSA	Abatement Feasible	Abatement Reasonable	Abatement Recommended	Reason for Noise Abatement Recommendation ¹
NSA-01	Yes	No	No	Exceeds Special Use Area Abatement Cost Factor of \$518,758/person/hour (\$2,500,000/person/hour)
NSA-04	No	--	No	Commercial Use Without Area of Frequent Human Use
NSA-05	No	--	No	Non-Continuous Barrier ²
NSA-06	No	--	No	Non-Continuous Barrier ²
NSA-08	Yes	No	No	Exceeds Reasonable Cost (\$49,844/benefitted receptor)
NSA-09	Yes	No	No	Exceeds Reasonable Cost (\$57,592/benefitted receptor)
NSA-10	Yes	No	No	Exceeds Reasonable Cost (\$225,472/benefitted receptor)
NSA-12	Yes	No	No	Exceeds Reasonable Cost (\$90,072/benefitted receptor)
NSA-13	Yes	No	No	Exceeds Reasonable Cost (\$280,000/benefitted receptor)
NSA-14	Yes	No	No	Exceeds Reasonable Cost (\$79,000/benefitted receptor)
NSA-16	No	--	No	Non-Continuous Barrier ²
NSA-17	Yes	No	No	Exceeds Reasonable Cost (\$95,000/benefitted receptor)
NSA-19	Yes	No	No	Exceeds Reasonable Cost (\$34,688/benefitted receptor) ³

Source: Traffic Noise Technical Report

¹ Additional details regarding recommendation reasons are provided in the Traffic Noise Technical Report.

² Noise barriers are most effective when they are a solid wall. Non-continuous barriers, or barriers that have gaps for driveways or other means of access, are much less effective at decreasing noise levels and unlikely to achieve the required 5 dBA noise reduction.

³ The cost per benefitted dwelling unit at NSA 19 was slightly less than the provisional \$35,000/benefitted receptor limit, but it was determined in consultation with ODOT officials that this receptor was not eligible for the higher limit.

3.17.3.3 Construction Impacts

Construction noise is expected as a result of the build alternatives and JTA phase. The NSAs that were identified for potential traffic noise impacts from the build alternatives and JTA phase might also experience elevated noise levels during construction, due their proximity to proposed roadways. Neither FHWA nor ODOT have identified specific construction noise impact levels. The noise ordinance for Medford exempts construction noise. For informational purposes Table 3.17-8 below shows typical noise level ranges for general construction equipment which may be used for this project. Insufficient project information exists to reasonably predict construction noise levels, at specific noise receptor locations, however, potential construction noise avoidance, minimization, and abatement measures are discussed below.

Table 3.17-8 Construction Noise Level Ranges

		Equipment Type	Noise Level at 50 feet (dBA), Range	Noise Level at 50 feet (dBA), Average ^a	Noise Level at 50 feet (dBA), Average ^b
Equipment Powered by Internal Combustion Engines	Earth Moving	Front Loader	72-84	78	85
		Backhoes	72-93	83	83
		Tractors	77-96	87	85
		Scrapers	80-93	87	87
		Graders	80-93	84	84
		Pavers	86-89	88	--
		Trucks	82-94	88	--
	Material Handling	Concrete Mixers	75-88	82	--
		Concrete Pumps	81-84	83	--
		Cranes, Moveable	75-88	82	79
		Cranes, Derrick	86-89	88	--
	Stationary	Pumps	68-72	70	--
		Generators	71-82	77	--
		Compressors	74-87	81	73
	Impact Equipment	Mounted Breaker (Hoe rams)	76-94 ^c	85	--
		Pneumatic Wrenches	82-89	86	--
		Jack Hammers, Rock Drills	81-98	90	--
		Impact Drivers (Peak)	95-106	101	--
Other		Vibrators	69-81	75	--
		Saws	72-82	77	--

Notes:

^a From Colorado Construction Noise Symposium, Construction Noise Ranges Chart

^b From Highway Construction Noise: Measurement, Prediction and Mitigation. US DOT, FHWA, HHI-22/R10-91(200)EW

^c From Allied Construction Products, Cleveland OH 1999

3.17.4 Avoidance, Minimization, and/or Abatement Measures

3.17.4.1 Direct Impacts

According to FHWA and ODOT policy, if noise impacts are identified, noise barriers must be considered as a potential noise abatement measure. Other potential noise abatement measures might include truck or speed restrictions, alignment changes, and depressed roadways. Heavy truck percentages are not high enough for truck restrictions to make a significant difference in noise levels (typically not exceeding two to three percent heavy trucks during peak hour) and any such truck restrictions would generally work against the purpose and need for the project. It is also ODOT policy not to restrict trucks on state highways. Likewise, speed restrictions below proposed speed limits would significantly reduce the ability of a bypass to meet the project's purpose and need while resulting in only a marginal noise reduction. Therefore, these other types of abatement measures are not recommended. As Table 3.17-6 indicates, noise abatement was not found to be reasonable and feasible for any of the identified noise impacts. Therefore no noise abatement measures are recommended.

3.17.4.2 Construction Impacts

Construction noise from the build alternatives, design options, and JTA phase would result in normal construction activity noise levels. These noise levels, although temporary in nature, can be annoying. The following construction noise abatement measures would be included in project design specifications.

Construction of either build alternative may cause localized, short-duration noise impacts. Medford has a noise exemption for construction sites; therefore, there are no specific local regulations governing construction noise. However, ODOT includes standard project specifications (290.32) for all projects to mitigate for construction noise impacts. These specifications are provided in Appendix H of ODOT's noise policy. The following construction measures reflect current ODOT standard specifications and would be part of the project contract:

- No construction shall be performed within 1,000 feet of an occupied dwelling unit on Sundays, legal holidays, or between the hours of 10 PM and 6 AM on other days without the approval of the ODOT construction project manager.
- All equipment used shall have sound-control devices no less effective than those provided on the original equipment. No equipment shall have unmuffled exhaust.
- All equipment shall comply with pertinent equipment noise standards of the U.S. EPA.
- No pile driving or blasting operations shall be performed within 3,000 feet of an occupied dwelling unit on Sundays, legal holidays, or between the hours of 8 PM and 8 AM on other days without the approval of the ODOT construction project manager.
- The noise from rock crushing or screening operations performed within 3,000 feet of any occupied dwelling shall be mitigated by strategic placement of material stockpiles between the operation and the affected dwelling or by other means approved by the ODOT construction project manager.

If a specific noise impact complaint is received during construction, the contractor may be required to implement one or more of the following noise mitigation measures at the contractor's expense, as directed by the construction project manager.

- Locate stationary construction equipment as far from nearby noise sensitive properties as feasible.
- Shut off idling equipment.
- Reschedule construction operations to avoid periods of noise annoyance identified in the complaint.
- Notify nearby residents whenever extremely noisy work will be occurring.
- Install temporary or portable acoustic barriers around stationary construction noise sources.
- Operate electrically powered equipment using line voltage power or solar power.

3.17.4.3 Information for Local Officials

FHWA and ODOT policies specify that local officials should be provided appropriate information to assist with future land use planning, especially with regard to the future planning and development of currently undeveloped lands near the proposed project right-of-way. To date, this coordination with local officials regarding noise levels has not occurred, but will take place at the conclusion of the public comment period for the DEIS.

ODOT will send the Noise Technical Report to the City of Medford and Jackson County planning officials within 100 days of the signature of the Record of Decision.

Areas that are currently undeveloped or for which development is neither planned nor programmed were not analyzed for project noise impacts. However, for undeveloped areas near the project where development may occur in future, noise levels could approach or exceed the NAC. Noise impact distances were developed using the TNM model to determine areas (as distance from a roadway section) that could create land use compatibility concerns. These are presented below in Table 3.17-9 for future build-year condition (2035). The 65 dBA contour distance represents the potential impact zone for land use activity categories B and C (residential and institutional) and the 70 dBA contour distance represents the potential impact zone for category E (noise sensitive commercial). For planning purposes, noise sensitive development should be restricted within these impact distances.

Table 3.17-9 Noise Impact Distances for Undeveloped Lands (2035)

Project Location	65 dBA Contour Distance (ft.) (Activity Categories B and C)	70 dBA Contour Distance (ft.) (Activity Category E)
I-5 to Delta Waters Road	175	15
Delta Waters Road to Vilas Road	200	100
Vilas Road to Agate Road	240	140
Agate Road to Dutton Road	175	25

3.17.5 Avoidance, Minimization, and/or Mitigation Commitments Incorporated into the Preferred Alternative

ODOT makes the following commitments.

JTA Phase

There are no mitigation commitments exclusive to the JTA phase.

JTA Phase and Preferred Alternative Subsequent to Construction of the JTA Phase

- ODOT will include standard project specifications (290.32) in the project contract to mitigate for construction noise impacts.
- If a specific noise impact complaint is received during construction, the contractor may be required to implement one or more of the following noise mitigation measures at the contractor's expense, as directed by the construction project manager:
 - Locate stationary construction equipment as far from nearby noise sensitive properties as feasible.
 - Shut off idling equipment.
 - Reschedule construction operations to avoid periods of noise annoyance identified in the complaint.
 - Notify nearby residents whenever extremely noisy work will be occurring.
 - Install temporary or portable acoustic barriers around stationary construction noise sources.
 - Operate electrically powered equipment using line voltage power or solar power.

Preferred Alternative Subsequent to Construction of the JTA Phase

There are no mitigation commitments exclusive to the Preferred Alternative.

3.18

Section 3.18 Content

- 3.18.1 Regulatory Setting
- 3.18.2 Affected Environment
 - 3.18.2.1 Energy Sources
 - 3.18.2.2 Base Year 2007
- 3.18.3 Environmental Consequences
 - 3.18.3.1 Direct Energy Impacts
 - 3.18.3.2 Construction Energy Impacts
- 3.18.4 Avoidance, Minimization, and/or Conservation Measures
 - 3.18.4.1 Avoidance, Minimization, and/or Conservation Measures for Operations Energy Impacts
 - 3.18.4.2 Avoidance, Minimization, and/or Conservation Measures for Indirect Energy Impacts
- 3.18.5 Avoidance, Minimization, and/or Conservation Commitments Incorporated into the Preferred Alternative

3.18 Energy

This section provides quantitative and comparative analyses of the energy-related impacts that could result from the project. The energy required to construct each build alternative was calculated, along with the energy consumed by vehicles operating in years 2007, 2015, and 2035. A discussion of measures to reduce energy consumption during construction and facility operations is provided.

3.18.1 Regulatory Setting

NEPA (42 USC Part 4332) requires the identification of all potentially significant impacts on the environment, including energy impacts. An energy analysis was conducted.

The analysis of the energy consumption was conducted in conformance with various federal and state regulations, guidelines, and policies. These regulations and guidelines evaluate energy efficiency and incorporate energy saving procedures into transportation facilities and programs. These policies are discussed in the OR 62 Corridor Solutions Project Energy Technical Report which is available from the ODOT contact person identified on page i of this EIS.

The Oregon Energy Plan and Statewide Planning Goal 13, Energy Conservation, (OAR 660-015-0000(13)) state that to conserve energy, land, and uses developed on the land shall be managed and controlled so as to maximize the conservation of all forms of energy, based upon sound economic principles. The project alternatives maintain consistency with departmental policies concerning encouragement of the energy conservations detailed in the goal.

Energy impacts are also considered in the following sections: Section 4.14 Energy Consumption, Chapter 4 Cumulative Impacts, Chapter 5 Relationship between Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity, Chapter 6 Irreversible and Irretrievable Commitments of Resources, and Appendix K FHWA National and ODOT Statewide Efforts Related to Climate Change.

3.18.2 Affected Environment

Rather than define an API, the energy analysis forecasted energy consumption on a series of roadway segments. These included all roadways that were included in the traffic analysis. The traffic analysis area included all intersections of collectors, arterials, or higher classification, where vehicle volumes would change with any of the build alternatives or design options. These volume changes were based on the RVMPO travel demand model. The energy analysis study area included the following major roadways:

- OR 62 from I-5 to Dutton Road;
- Table Rock Road from Biddle Road to Antelope Road;
- Vilas Road from Table Rock Road to OR 62;
- Antelope Road from Table Rock Road to OR 62; and
- Avenue G from 11th Street to OR 62.

3.18.2.1 Energy Sources

Transportation-related energy is predominantly derived from petroleum-based fuel sources, with gasoline and diesel being the primary fuel sources. Because energy generated from these resources generally accounts for over 95 percent of the total energy demand for the transportation sector, energy use generally refers to energy originating from crude oil products.

Petroleum is the largest source of energy used in Oregon. Oregon imports 100 percent of its petroleum. Approximately 90 percent of Oregon's petroleum comes from the Puget Sound area in Washington through the Olympic Pipeline to Portland and then on to Eugene. The remaining ten percent comes from either California, the northern Rockies states, or is imported from Asia and Canada.

3.18.2.2 Base Year 2007

Year 2007 serves as the "base year" condition for this analysis. The operation of vehicles in 2007 within the analysis area consumed an estimated total of 2,041 million British Thermal Units (Btu) per day. This consumption is equivalent to approximately 16,148 gallons of gasoline per day, over an estimated 0.43 million daily VMT. On an annual basis, in 2007, the energy and fuel consumption are estimated to be 744,917 million Btu per year and 5.89 million gallons per year, respectively, from an estimated 156 million annual VMT. Table 3.18-1 summarizes the 2007 existing daily and annual energy consumption for automobiles and trucks.

For more information on energy, including citations to source documents, refer to the *OR 62 Corridor Solutions Project Energy Technical Report*, May 2011. This report is available from the ODOT contact person identified on page i of this EIS.

A British Thermal Unit (Btu) is the amount of heat energy needed to raise the temperature of one pound of water by one degree F. This is the standard measurement used to state the amount of energy that a fuel has, as well as the amount of output of any heat generating device.

Table 3.18-1 2007 Daily and Annual Operations Energy Consumption

Vehicle Type	Daily					Annual ³
	VMT ¹	Energy Consumption ² (Millions of Btu/day)	Fuel Consumption (gal/day)	VMT	Energy Consumption ² (Millions of Btu/year)	Fuel Consumption (gal/year)
Auto	413,874	1,818	14,548	151,063,856	663,656	5,309,252
Truck	13,536	223	1,602	4,940,636	81,260	584,606
TOTAL	427,410	2,041	16,148	156,004,492	744,917	5,893,858

Source: OR 62 Corridor Solutions Project Energy Technical Report (May 2011)

MPG = Miles per Gallon

Btu = British Thermal Unit

VMT = Vehicle Miles Traveled

¹ VMT analysis for energy consumption differs from VMT in Sections 3.1 and 3.16 because data was taken from different locations on the corridor.

² Energy Consumption, Auto: Btu/gallon of gasoline = 125,000, Trucks: Btu/gallon of diesel = 139,000

³ Annual energy consumptions are estimates only and do not accurately account for variations in seasonal energy use

3.18.3 Environmental Consequences

This section evaluates and assesses potential impacts on the transportation-related energy consumption within the area of analysis. The energy analysis focuses on the following components:

- Energy consumed during operation of the build alternatives; and
- Energy consumed during construction of the build alternatives.

3.18.3.1 Direct Energy Impacts

Direct energy impacts refer to the fuel consumed by vehicles operating under the No Build Alternative, and the build alternatives, including the JTA phase. With the build alternatives, overall transportation-related performance in the existing OR 62 is expected to improve. Traffic is anticipated to be split between the existing OR 62 and the proposed bypass. Therefore, there would be an overall improvement in operations along existing OR 62.

Although the projected increase over time in VMT for the build alternatives indicates that more energy use is expected due to the project, intersection delay is expected to decrease, which would result in some localized energy savings not captured in the operations energy analysis. As a result of the improved operations, intersection queues would be shortened and congestion on the existing OR 62 would be expected to decrease.

No Build Alternative

The 2015 No Build Alternative would require approximately 2 percent more operations energy than the 2007 condition. The 2035 No Build Alternative would require approximately 14 percent more operations energy than the 2007 condition. Table 3.18-2 compares the daily and annual energy consumption for the 2007, 2015, and 2035 conditions.

SD and DI Alternatives

The SD and DI Alternatives would increase energy consumption over the No Build Alternative. The 2015 SD and DI Alternatives would require up to approximately 21 and 19 percent more operations energy, respectively, than the 2015 No Build Alternative. The 2015 SD Alternative would require approximately 1 percent more operations energy than the 2015 DI Alternative, as shown in Table 3.18-2.

The 2035 SD and DI Alternatives would require approximately 28 and 22 percent more operations energy, respectively, than the 2035 No Build Alternative. The 2035 SD Alternative would require approximately 4 percent more operations energy than the 2035 DI Alternative, as shown in Table 3.18-2.

Table 3.18-2 Forecast Consumption by Alternative and JTA Phase

	Daily			Annual ³		
	VMT ¹	Energy Consumption ² Millions of Btu/day	Fuel Consumption gal/day	VMT	Energy Consumption ² Millions of Btu/year	Fuel Consumption gal/year
Existing Year 2007	427,410	2,041	16,148	156,004,492	744,917	5,893,858
Design Year 2015						
2015 No Build Alternative	446,491	2,090	16,520	162,969,393	762,857	6,029,828
2015 SD Alternative	543,085	2,528	20,026	198,226,008	924,153	7,309,383
2015 DI Alternative	535,991	2,492	19,720	195,636,663	909,681	7,197,860
2015 JTA Phase	442,470	2,075	16,404	161,501,681	757,427	5,987,437
Future Year 2035						
2035 No Build Alternative	543,939	2,327	18,397	198,537,886	849,533	6,714,831
2035 SD Alternative	698,012	2,968	23,471	254,774,247	1,083,166	8,566,882
2035 DI Alternative	669,802	2,840	22,474	244,477,814	1,036,744	8,203,168
2035 JTA Phase	555,876	2,378	18,801	202,894,723	868,150	6,862,265

Source: OR 62 Corridor Solutions Project Energy Technical Report (May 2011)

Btu = British Thermal Unit, VMT = Vehicle Miles Traveled

¹VMT analysis for energy consumption differs from VMT in Sections 3.1 and 3.16 because data was taken from different locations on the corridor.

² Energy Consumption, Auto: Btu/gallon of gasoline = 125,000, Trucks: Btu/gallon of diesel = 139,000

³Annual energy consumptions are estimates only and do not accurately account for variations in seasonal energy use.

There are some differences in alignment between the design options of the build alternatives and the JTA phase; however there are no differences in traffic patterns. Therefore, no separate analysis of energy consumption was conducted for the design options. Traffic volumes for Design Options A, B, and C would be identical in 2035; therefore, the energy consumption for all design options would also be identical.

JTA Phase

The 2015 JTA phase would require approximately 1 percent less operations energy than the 2015 No Build Alternative. The 2035 JTA phase would require approximately 2 percent more operations energy than the 2035 No Build Alternative, as shown in Table 3.18-2.

For a complete comparison of differences in energy consumption between the alternatives for the Design Year 2015 and Future Year 2035, refer to Table 5-3 and Table 5-4, in the Energy Technical Report. The Energy Technical Report is available from the ODOT contact person provided on page i of this EIS.

3.18.3.2 Construction Energy Impacts

Construction energy consumption is based on preliminary construction cost estimates.

No Build Alternative

Under the No Build Alternative there would be no construction energy impacts.

Build Alternatives

The SD Alternative would require approximately 16 percent more energy to construct than the DI Alternative. This difference equates to approximately 90,275 million Btu, or 0.72 million gallons of gasoline, as shown in Table 3.18-3. This would be due to more pavement, earthwork, construction of the bridge over Bear Creek, and other construction activities and materials.

JTA Phase

The JTA phase would consume approximately 226,911 million Btu or 1.82 million gallons of gasoline for construction, as shown in Table 3.18-3.

Table 3.18-3 Construction Energy Consumption for the Build Alternatives and the JTA Phase

	SD Alternative	DI Alternative	JTA Phase
Preliminary Construction Cost (2007\$)¹	\$220,000,000 ²	\$190,000,000 ³	\$92,000,000 ⁴
Energy Consumption (Million Btus)	660,481	570,206	226,911
Fuel Consumption (Million Gallons of Gasoline)	5.28	4.56	1.82

Source: OR 62 Corridor Solutions Project Energy Technical Report (May 2011)

Btu = British Thermal Unit

¹ For purposes of this energy analysis, costs do not include right-of-way acquisition.

² Range of Cost for SD Alternative: \$200,000,000 - \$240,000,000, the median cost is \$220,000,000

³ Range of Cost for DI Alternative: \$170,000,000 - \$210,000,000, the median cost is \$190,000,000

⁴ Range of Cost for the JTA phase: \$80,000,000 - \$104,000,000, the median cost is \$92,000,000

3.18.4 Avoidance, Minimization, and/or Conservation Measures

Direct and indirect energy impacts expected to result from this project are described above. While no energy regulations are in place that would require mitigation measures, conservation measures could be implemented during construction and operations/maintenance to increase the long-term potential for energy savings.

3.18.4.1 Avoidance, Minimization, and/or Conservation Measures for Operations Energy Impacts

Conservation measures to reduce operations energy impacts could include the following types of projects and improvements.

- Intersection improvements that reduce idle time
- Pedestrian and bikeway improvements that provide for non-gasoline powered transportation
- Signal synchronization that reduce idle time
- Ramp metering that reduces congestion
- Bus turnouts that reduce vehicle idling behind stopped buses
- Rideshare programs that reduce the number of vehicle trips

3.18.4.2 Avoidance, Minimization, and/or Conservation Measures for Indirect Energy Impacts

Examples of conservation measures that could reduce energy use during construction are:

- Minimize the number of hauling trips by using full trucks to and from the site
- Using recycled materials when possible, so that energy is not used to create new products
- Using regional products whenever possible to reduce the distance materials travel
- Using bio-diesel or other non-petroleum fuels
- Limiting vehicle idling
- Locating staging areas near work sites
- Reusing construction signage, barriers, lighting, and other common materials to reduce energy in the production of materials

3.18.5 Avoidance, Minimization, and/or Conservation Commitments Incorporated into the Preferred Alternative

ODOT makes the following commitments.

JTA Phase

There are no mitigation commitments exclusive to the JTA phase.

JTA Phase and Preferred Alternative Subsequent to Construction of the JTA Phase

- ODOT will minimize the number of hauling trips by using full trucks to and from the site;
- ODOT will use recycled materials when possible, so that energy is not used to create new products;
- ODOT will use regional products whenever possible to reduce the distance materials travel; and
- ODOT will reuse construction signage, barriers, lighting, and other common materials to reduce energy in the production of materials.

Preferred Alternative Subsequent to Construction of the JTA Phase

There are no mitigation commitments exclusive to the Preferred Alternative.

Section 3.19 Content

- 3.19.1 Regulatory Setting
- 3.19.2 Affected Environment
- 3.19.3 Environmental Consequences
 - 3.19.3.1 Direct Impacts
 - 3.19.3.2 Indirect Impacts
 - 3.19.3.3 Construction Impacts
- 3.19.4 Avoidance, Minimization, and/or Mitigation Measures
- 3.19.5 Avoidance, Minimization, and/or Mitigation Commitments Incorporated Into the Preferred Alternative

For more information on geology, including citations to source documents, refer to the *OR 62 Corridor Solutions Geotechnical Memorandum*, updated July 2011. This report is available from the ODOT contact person identified on page i of this EIS.

Alluvium is loose soil or sediment that has been eroded, reshaped by water, and redeposited in a non-marine setting.

3.19 Geology

This section discusses geology, soils, and seismic concerns as they relate to the environment, public safety, and project design both during construction and after completion of the project. Landslides, earthquakes, and general soil suitability are prime considerations in the design and retrofit of structures as well as cut and fill slopes for roadway designs. The National Natural Landmarks Programs is codified in 36 CFR 62. This program identifies and preserves natural areas that best illustrate the biological and geological character of the United States, enhances the scientific and educational values of preserved areas, strengthens public appreciation of natural history, and fosters a greater concern for the conservation of the nation's natural heritage.

3.19.1 Regulatory Setting

Design guidance and standards include those in the American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications, 5th edition 2010 with June 2010 errata, FHWA Design Guidelines, and the ODOT Geotechnical Design Manual.

3.19.2 Affected Environment

The project area is located in the southern Rogue River Valley, in the northeast portion of the Klamath Mountains, to the north of the Siskiyou Range. The area is known as the Agate Desert. The local geology includes alluvium deposits from the Siskiyou Mountains, which consist of clays, sands, and gravels deposited on top of the bedrock by surface water and wind. Depth to bedrock in the area ranges from approximately 5 to 44 feet (ODOT 2001). The water table in the project area fluctuates between 0.5 feet above and 1.5 feet below the surface from December through April (ODOT 2001).

The project area lies at an elevation of about 1,300 feet. The land generally slopes to the northwest toward Bear Creek and the Rogue River. The project area is relatively flat, with a slope typically in the range of about 20 feet per mile (0.4%). Soils in the project area are mainly clays, which tend to drain poorly.

In the project area, there is a low direct potential for geologic hazards such as earthquakes, landslides, and soil erosion. There have been no damaging earthquakes recorded in the area and there are no mapped faults beneath the project area. Since the area is relatively flat, landslides and rockfalls are unlikely.

3.19.3 Environmental Consequences

3.19.3.1 Direct Impacts

No Build Alternative

There would be no direct, indirect, or cumulative geologic or soil impacts associated with the No Build Alternative.

Build Alternatives and JTA Phase

Potential direct impacts related to geology would be the same, regardless of the build alternative or design option chosen.

Seismic Hazards. The project would be designed and constructed to meet all current seismic hazard standards, so there would be no impacts associated with seismic hazards.

Erosion Hazards. Permanent cut and fill slopes could be susceptible to erosion. The proposed road could create slopes that are steeper than the existing topography. Steeper slopes would be more susceptible to erosion than flatter slopes, particularly before vegetation is reestablished. Erosion control BMPs such as using filter cloths and vehicle tracking controls for site work; limiting work during wet periods; treating dewatering water with flocculants; and properly discharging the treated waters to ground away from wetlands or, with authorization, to sanitary sewers, would help reduce erosion.

Groundwater. The proposed cuts and/or fills could intersect the shallow groundwater that is typical of the area.

The build alternatives would be designed to comply with applicable geotechnical design standards.

3.19.3.2 Indirect Impacts

The project area is moderately developed, which has limited the soil productivity in the area and modified its ability to absorb water and recharge the groundwater. Increased development in the project area would increase impervious surface cover, as described in Section 3.10, and present barriers to the natural hydrology and opportunity for groundwater recharge.

3.19.3.3 Construction Impacts

During construction, soils would be exposed, increasing the potential for erosion to occur. Construction of proposed road cuts and retaining walls could create temporary slope instability.

3.19.4 Avoidance, Minimization, and/or Mitigation Measures

All locations where the proposed project would be built on fill slopes or overpasses, would be designed and constructed to meet current seismic hazard standards.

All retaining walls, embankment fills, cut slopes, and bridge abutments would be designed and constructed with appropriate temporary and permanent erosion and/or scour control measures to minimize the potential for erosion and slope instability in accordance with ODOT, AASHTO, and FHWA guidelines. These erosion and scour control measures are described in more detail in Section 3.10.4 and would help reduce the construction impacts.

The project must conform to the ODOT construction storm water permit, which requires the use of erosion and sediment control BMPs. The generally flat terrain should make erosion and sediment control BMPs easy to select and design to the site, and effective when used. Clay-rich soils would require special attention to turbidity control. This can be achieved by using filter cloths and vehicle tracking controls for site work, treating dewatering water with flocculants, if necessary, and properly discharging the treated waters to ground away from wetlands or, with authorization, to sanitary sewers. Long periods of dry weather are common in the Rogue Valley and it may be possible to restrict work in the clay rich soils to those time periods. Potential impacts from in-water work include temporary sedimentation and increases in turbidity that could occur due to streambed disturbances during construction.

3.19.5 Avoidance, Minimization, and/or Mitigation Commitments Incorporated into the Preferred Alternative

ODOT makes the following commitments.

JTA Phase

There are no mitigation commitments exclusive to the JTA phase.

JTA Phase and Preferred Alternative Subsequent to Construction of the JTA Phase

- For all locations where the project will be built on fill slopes or overpasses, ODOT will design and construct these project elements to meet current seismic hazard standards.
- ODOT will design and construct all retaining walls, embankment fills, cut slopes, and bridge abutments with appropriate temporary and permanent erosion and/or scour control measures to minimize potential for erosion and slope instability in accordance with ODOT, AASHTO, and FHWA guidelines.
- ODOT will pay special attention to turbidity control due to the clay-rich soils. This will be achieved by using filter cloths and vehicle tracking controls for site work, treating dewatering water with flocculants, if necessary; and properly discharging the treated waters to ground away from wetlands or, with authorization, to sanitary sewers.

Preferred Alternative Subsequent to Construction of the JTA Phase

There are no mitigation commitments exclusive to the Preferred Alternative.

Section 3.20 Content

- 3.20.1 Regulatory Setting
- 3.20.2 Affected Environment
- 3.20.3 Environmental Consequences
 - 3.20.3.1 Direct Impacts
 - 3.20.3.2 Indirect Impacts
 - 3.20.3.3 Construction Impacts
- 3.20.4 Avoidance, Minimization, and/or Mitigation Measures
 - 3.20.4.1 Minimization and Avoidance Measures
 - 3.20.4.2 Mitigation Measures
- 3.20.5 Avoidance, Minimization, and/or Mitigation Measures Incorporated Into the Preferred Alternative

3.20**3.20 Hazardous Materials**

This section addresses contaminated sites potentially encountered, wastes generated from, and hazardous materials likely to be used in construction of the project.

3.20.1 Regulatory Setting

Hazardous materials and hazardous wastes are regulated by many state and federal laws. These laws include not only specific statutes governing hazardous waste, but also a variety of laws regulating spill cleanup, air and water quality, human health, and land use.

The primary federal laws regulating hazardous wastes/materials are the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). RCRA provides for “cradle to grave” regulation of wastes as well as regulating underground storage tanks, which are a common source of contamination. The purpose of CERCLA, often referred to as Superfund, is to clean up contaminated sites so that public health and welfare are not compromised. Other relevant federal laws and regulations include, but are not limited to:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act (CWA)
- Clean Air Act (CAA)
- Safe Drinking Water Act
- Hazardous Waste Operations and Emergency Response (HazWOPER)
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

Waste management, hazardous waste, cleanup and underground storage tanks in Oregon are regulated under the authority of RCRA and CERCLA, and the Revised Statutes, ORS 459, and 459A, ORS 465 and ORS 466, respectively. Other Oregon laws that affect hazardous materials, waste, and hazardous waste are specific to water quality, transportation, emergency planning, community right-to-know, and worker health and safety requirements.

Health and safety for both workers and the public are key issues when dealing with hazardous materials and hazardous waste. Proper management of hazardous materials and disposal of hazardous waste are vital if disturbed during project construction.

For more information on hazardous materials, including citations to source documents, refer to the *OR 62 Corridor Solutions Project Hazardous Materials Technical Report*, July 2011. This report is available from the ODOT contact person identified on page i of this EIS.

3.20.2 Affected Environment

There are 99 identified Sites of Concern (SOCs) in the Hazardous Materials API, as shown in Figure 3.20-1. There are no Superfund sites in the project area. These sites were identified from a Level 1 Site Assessment, which involves database searches and site reconnaissance, but does not involve environmental sampling. These SOCs are separated into two categories: 49 Recognized Environmental Concern (REC) sites and 50 Potential Environmental Concern (PEC) sites. RECs are sites that have been identified as environmental concerns in existing databases, while PECs are sites that could pose environmental concerns based on the type of facility, but are not necessarily listed on existing databases. Each property was only counted as one environmental concern site, even if it contains multiple recognized and potential environmental conditions.

The SOCs included in this report were identified through three primary assessment tasks:

1. Database Review. RECs were identified by reviewing the following databases and files:

- EPA National Priority List (NPL)
- DEQ Environmental Cleanup Site Information (ECSI)
- DEQ Leaking Underground Storage Tank (LUST)
- DEQ Solid Waste Facilities/Landfill Sites
- EPA RCRA Generators
- DEQ Underground Storage Tank (UST)

2. Drive-by Reconnaissance. PECs were identified by systematically driving the API to identify possible sources of contamination, such as gas stations, shooting ranges, logging companies, scrap and recycling yards, automotive shops and former log yards, not listed in the above databases.

3. Historical Aerial Photograph Review. PECs were also identified by reviewing past aerial photographs of the area to understand past land use practices within the API.

3.20.3 Environmental Consequences

3.20.3.1 Direct Impacts

Direct impacts from hazardous materials could occur from construction. These impacts could result from disturbing SOCs in and near the project footprint during construction. This could lead to releases of hazardous materials into the environment, which could result in prolonged effects to groundwater and surface water quality and health effects to wildlife and humans. Remediation activities could be required to remove or contain hazardous materials encountered or disturbed, which would require long-term monitoring of the area, such as ground and surface water monitoring for hazardous pollutants.

Each SOC was ranked as low, moderate, or high concern based on the anticipated likelihood for each SOC to be impacted. The SOCs were ranked separately for each build alternatives and JTA phase, because its proximity to the alternative or design option footprint influences its likelihood to be impacted. SOCs were ranked using the following ranking system:

- **Low concern** – There is low or insignificant potential for hazardous materials to impact the soil and groundwater beneath the build alternatives and JTA phase. Since past and present activities have been documented as having insignificant or low potential no further action is needed.
- **Moderate concern** – Potential exists for hazardous materials to impact the soil and groundwater beneath the build alternatives and JTA phase, and further action is recommended. Typically, further action involves sampling of materials, ground or groundwater to determine if hazardous materials are present and the extent of that presence. A moderate ranking is also assigned to sites that have not been fully investigated, or limited information was available for review.
- **High concern** – There is high potential for hazardous materials to impact the soil and groundwater beneath the build alternatives and JTA phase, and further action would likely be required.

The analysis conducted did not include an evaluation of regulatory compliance, the testing of soil or groundwater, and surveys or sampling for asbestos, lead paints, drinking water, or radon.

Figure 3.20-1

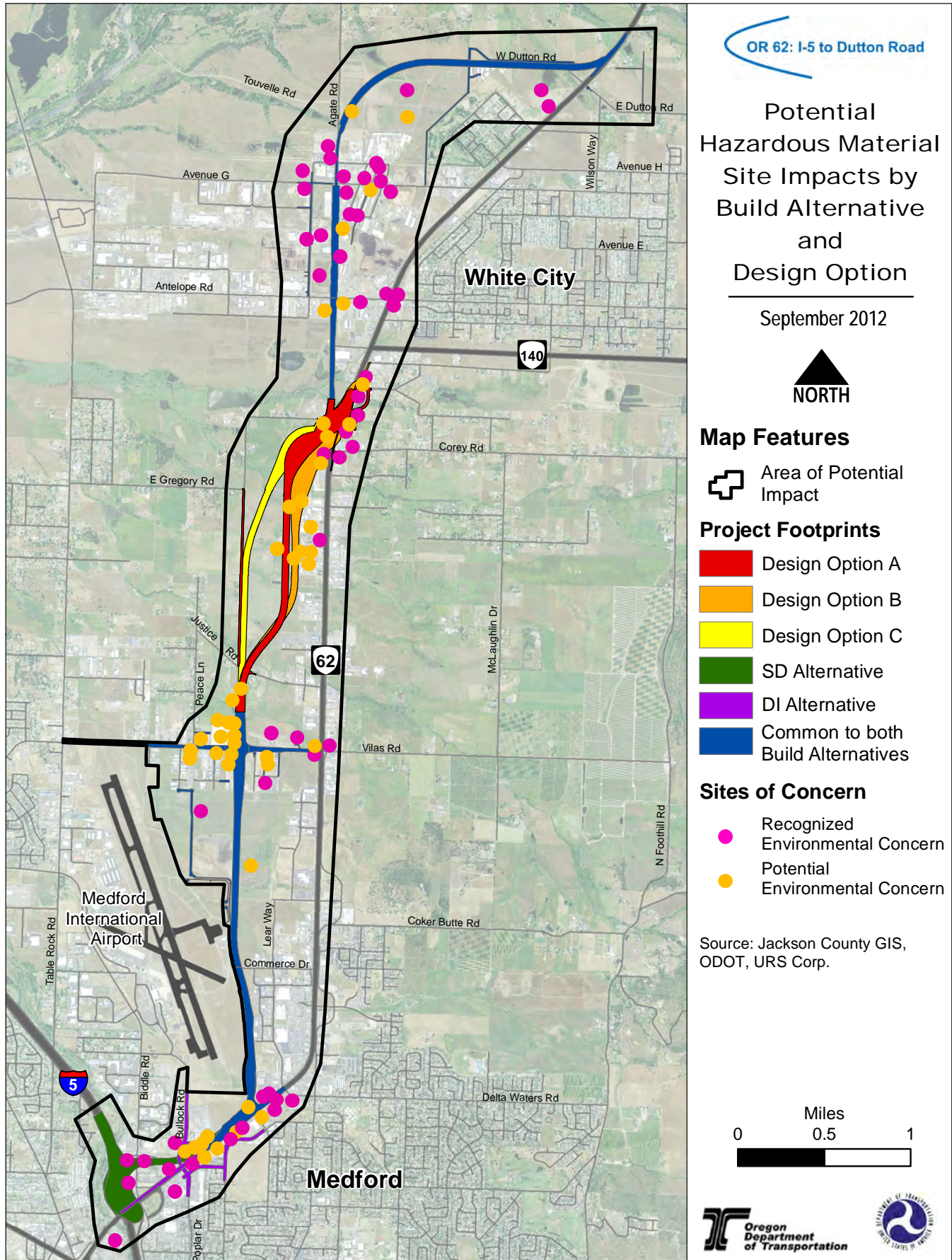
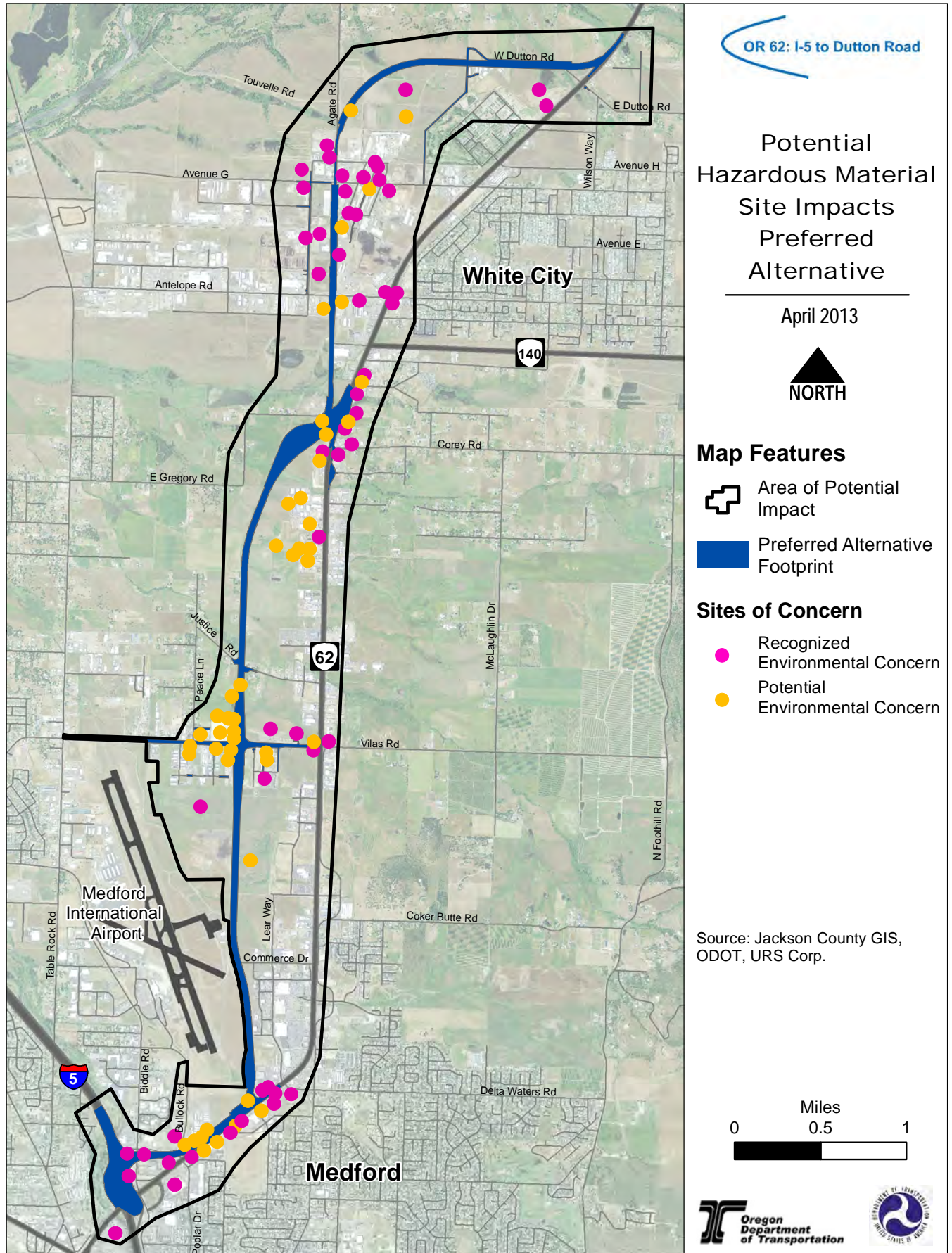


Figure 3.20-1 FEIS



No Build Alternative

There are no right-of-way acquisitions or construction activities involved in the No Build Alternative. Therefore there would be no potential impacts on hazardous material sites nor would clean-up be required as a result of the No Build Alternative.

Build Alternatives

Figure 3.20-1 shows the potential site impacts for each build alternative and design option. Table 3.20-1 summarizes the number of SOC's that could be potentially impacted by each build alternative and design option. Both build alternatives could impact hazardous materials sites, leading to the types of effects listed above. SOC's with low concern are not considered potential impacts. The DI Alternative could impact up to 70 hazardous materials sites (depending upon which design option is selected), with up to 29 sites of high concern. Potential impacts from the SD Alternative would be less, with up to 65 total site impacts. The SD Alternative could impact up to 28 high concern sites, one less than the DI Alternative. Table 3.20-2 lists the sites with a high level of concern, including a description of the site. Figure 3.20-2 shows the high concern sites that could be impacted by the full build alternatives and their design options. Site identification (ID) numbers provided on Table 3.20-2 correlate with the site ID numbers shown on Figure 3.20-2.

Figure 3.20-2 FEIS shows the high concern sites for the Preferred Alternative (the SD Alternative with Design Option C). These include all of the sites included in Figure 3.20-2 except for sites 82, 83, and 87 through 89 described in Table 3.20-2, which would only be sites of high concern for Design Option A or B.

As described in Sections 3.12.4.1, 3.13.4.4, and 3.13.4.5, ODOT will mitigate for the impacts of the Preferred Alternative on wetlands and associated endangered species at the Kincaid Property Mitigation Site shown in Figure 3.12-9. ODOT hazardous materials staff conducted a visual inspection of the site in June 2012. According to a June 15, 2012, memorandum, the inspection found "obvious signs of ground disturbance and/or waste piles that may have originated from offsite locations or may have contained contaminated material" and that the "potential for hazardous materials at the site is low." The inspection identified an underground holding tank near the former home site. The memorandum stated that, "at the time of construction the holding tank should be pumped out by a licensed septic provider and backfilled under Oregon Department of Environmental Quality guidelines for decommissioning of septic tanks."

Design Options

Potential impacts on hazardous material sites from the design options would be common to both build alternatives. Design Option A would have the potential to impact the most hazardous materials sites: one more than Design Option B and two more than Design Option C. However, Design Options A and B would have the same amount of potential to impact high ranked sites: two more than Design Option C. Design Options A and C would both potentially impact one more moderate ranked site than Design Option B. Table 3.20-1 summarizes the impacts from each design option for the build alternatives.

Table 3.20-1 Summary of Hazardous Materials Impacts

Level of Concern	Build Alternatives and Design Options					
	SD Alternative			DI Alternative		
	Option A	Option B	Option C (Preferred Alternative)	Option A	Option B	Option C
RECs						
Low	16	16	16	13	13	13
Moderate	10	10	10	12	12	12
High	5	5	5 3	6	6	6
PECs						
Low	18	19	20	16	17	18
Moderate	27	26	27	29	28	29
High	23	23	21 20	23	23	21
Total SOC						
Low	34	35	36	29	30	31
Moderate	37	36	37	41	40	41
High	28	28	26 23	29	29	27

Source: Hazardous Material Technical Report

Table 3.20-2 Summary of High Concern Sites

Site Name	Site ID Number	Site Description
Witham Truck Stop	2	Site is a HW generator. There is possibility of residues left behind, as well as possible unreported spills from trucks before being worked on.
Witham Truck Stop Division	3	Seven USTs are located on site with capacity of 68,000 gallons of diesel and gasoline. During heavy rains the site's oil/water separator has failed in the past and discharged large amounts of oil into a culvert under I-5. DEQ lists the status as a SSRFI.
ICI Delux Paints	9	Site has a past history of a LUST that released heating oil into soil and groundwater. DEQ lists the site status as NFAR.
Medco Road Former Orchard	16	Site is listed by DEQ as an ECSI and the status is SSRFI. Historical practices at orchard sites included the use of agricultural chemicals including herbicides, pesticides, petroleum products, and fertilizers.
Burns Tire Recycling Inc. & Dale Joe Property	28	Site is listed by DEQ as an ECSI. Hazardous levels of lead and tank bottom sludge were present in soils on site from past site use, which have cleaned up and site status is now NFAR. Current site use has a Solid Waste permit. <i>This site is no longer a site of high concern due to the removal of the Crater Lake Avenue extension to Gramercy Drive.</i>
Floyd's Rent-All & Sales, Inc.	29	Site has past history of a LUST that released gasoline. Cleanup has been completed and site status is NFAR. <i>This site is no longer a site of high concern due to the removal of the Crater Lake Avenue extension to Gramercy Drive.</i>
Pristine Auto Detailing	56	Condition of site is unknown but marked as high concern due to hazardous chemicals likely used at the site.
Boyz & Girlz Toyz Motorcycle shop	57	Hazardous materials related with motorized vehicles are most likely present within the building.
Residential Building	58	The presence of heating oil UST's at residential properties is unknown.
Action U-Pull-it	67	No spills are on record on site, but with the nature of the current land use it is likely that multiple small spills have occurred on the site and other hazardous materials are present.
McQuigg Carl Auto Body & Paint, Action Auto Parts & Recycler	68	Based on the type of business at this location, hazardous materials are likely to be present.
Speedway Auto Parts	70	Hazardous materials on site are likely due to Speedway Auto Parts current land usage.
Industrial Complex	72	The industrial complex consists of Gaddy's Equipment Sales, Burgman's Shop and Dan Anderson Wholesale Auto. The possibility of small spills related to repairs and general maintenance is likely. During a site reconnaissance of the area a small AST was seen as well as a small stock pile of used tires in the back of Burgman's Shop Property.
Concrete Blocks	73	This property is covered in concrete fill transported from an unknown source. The possibility of lead, cadmium, chromium concrete coating materials and asbestos contamination are all present at this property.
Barn structure	75	Contents of the barn structure are unknown.
Barn structure	77	Contents of the barn structure are unknown.
Residential Building	79	Unknown presence of heating oil tank and hazardous building materials.
Residential Building	80	Unknown presence of hazardous building materials and contents of a shop associated with the property.
Junk Yard (With unidentified AST's)	82	The junkyard has unidentified ASTs with unknown contents and tank integrity. <i>This site would only be a site of high concern for Design Option A or B. It is not a site of high concern for the Preferred Alternative (SD with Design Option C).</i>
Residential Building	83	Site has high potential for heating oil UST and unknown building materials. <i>This site would only be a site of high concern for Design Option A or B. It is not a site of high concern for the Preferred Alternative (SD with Design Option C).</i>
Large AST	87	The AST has a red #3 flammable placard but has unknown contents. <i>This site would only be a site of high concern for Design Option A or B. It is not a site of high concern for the Preferred Alternative (SD with Design Option C).</i>

Table 3.20-2 Summary of High Concern Sites

Oregon Light Truck & RV	88	Oregon Light Truck & RV has the possibility of possessing petroleum contaminants and other automotive associated hazardous materials on site. <i>This site would only be a site of high concern for Design Option A or B. It is not a site of high concern for the Preferred Alternative (SD with Design Option C).</i>
Wilson Equipment Rentals & Sales	89	There is a possibility of small to large oil and fuel based spills from used equipment stored on this site. <i>This site would only be a site of high concern for Design Option A or B. It is not a site of high concern for the Preferred Alternative (SD with Design Option C).</i>
Residential Building	91	Unknown presence of a heating oil UST and contents of shop on property.
Site Name	Site ID Number	Site Description
White City Metals	93	It is uncertain what types of coating and possible contents these used metals contain. There is a possible presence of lead, cadmium, and chromium coatings as well as other contaminants. <i>This site is no longer a site of high concern due to the removal of the Crater Lake Avenue extension to Gramercy Drive.</i>
C&R Salvage	44	Site listed by DEQ as an ECSI with RFI status. Ongoing release of waste oil has been occurring and was first documented on 11/25/1992. No known remedial action has been documented to date.
Timber Products Co. Limited Partnership	45	Site is listed by DEQ as a LUST and ECSI due to diesel fuel release. Site has been cleaned up but some oil has still been observed on the property. Site status is RFI.
Cascade Wood Products	47	Site is listed by DEQ as an ECSI with RFI status. PCP contamination has occurred on site contaminated soils and groundwater and some areas of the Ken Denman State Wildlife Refuge.
EF Burrill Lumber Site (Former)	49	Site is listed by DEQ as an ECSI and HW generator. There is a possibility of contamination from solvents and oils based on an anonymous complaint in 2003.
Richard R. Wilson Trucking	52	Site is a solid waste location due to storage of used waste tires.
Burrill Lumber Landfill	53	Site is listed by DEQ as a solid waste dump site since 09/15/1978. The waste type is industrial wood and the status of the site is closed as of 03/18/2003.
Residential Building	100	There are multiple pieces of heavy equipment located on site along with at least one AST that is visible from the road. Petroleum contamination hazards are often associated with similar sites.

Notes:

AST = Aboveground Storage Tank

DEQ = Oregon Department of Environmental Quality

HW = Hazardous Waste

LUST = Leaking Underground Storage Tank

SSRFI = Suspect Site Requiring Further Investigation

NFAR = No Further Action

PCP = Pentachlorophenol

ECSI = Environmental Cleanup Site Information

UST = Underground Storage Tank

RFI = Requiring Further Investigation

SSRFI = Suspect Site Requires Further Investigation

JTA Phase

JTA phase Design Option A would have the potential to impact the most high concern sites: one more than JTA phase Design Option B and two more than JTA phase Design Option C. Figure 3.20-3 shows the SOCs that could be impacted by the JTA phase. Table 3.20-3 summarizes the number of SOCs that could be potentially impacted by the JTA phase and each design option. Figure 3.20-4 shows the high concern sites that could be impacted by the JTA phase and its design options. Site ID numbers provided on Table 3.20-2 correlate with the site ID numbers shown on Figure 3.20-4.

Figure 3.20-4 FEIS shows the high concern sites for the JTA phase. Due to the selection of Design Option C, sites 82, 83, and 87 through 89 described in Table 3.20-2 will no longer be sites of high concern.

Due to the design refinements at the northern terminus of the JTA phase since the DEIS was published, the JTA phase will result in three fewer sites of high concern than were identified for the DEIS. These are sites 28, 29, and 93 described in Table 3.20-2. Due to the removal of the Crater Lake Avenue extension to Gramercy Drive that was included in the JTA phase in the DEIS, these three sites will no longer be adjacent to the JTA phase and, therefore, will not be sites of high concern.

Figure 3.20-2

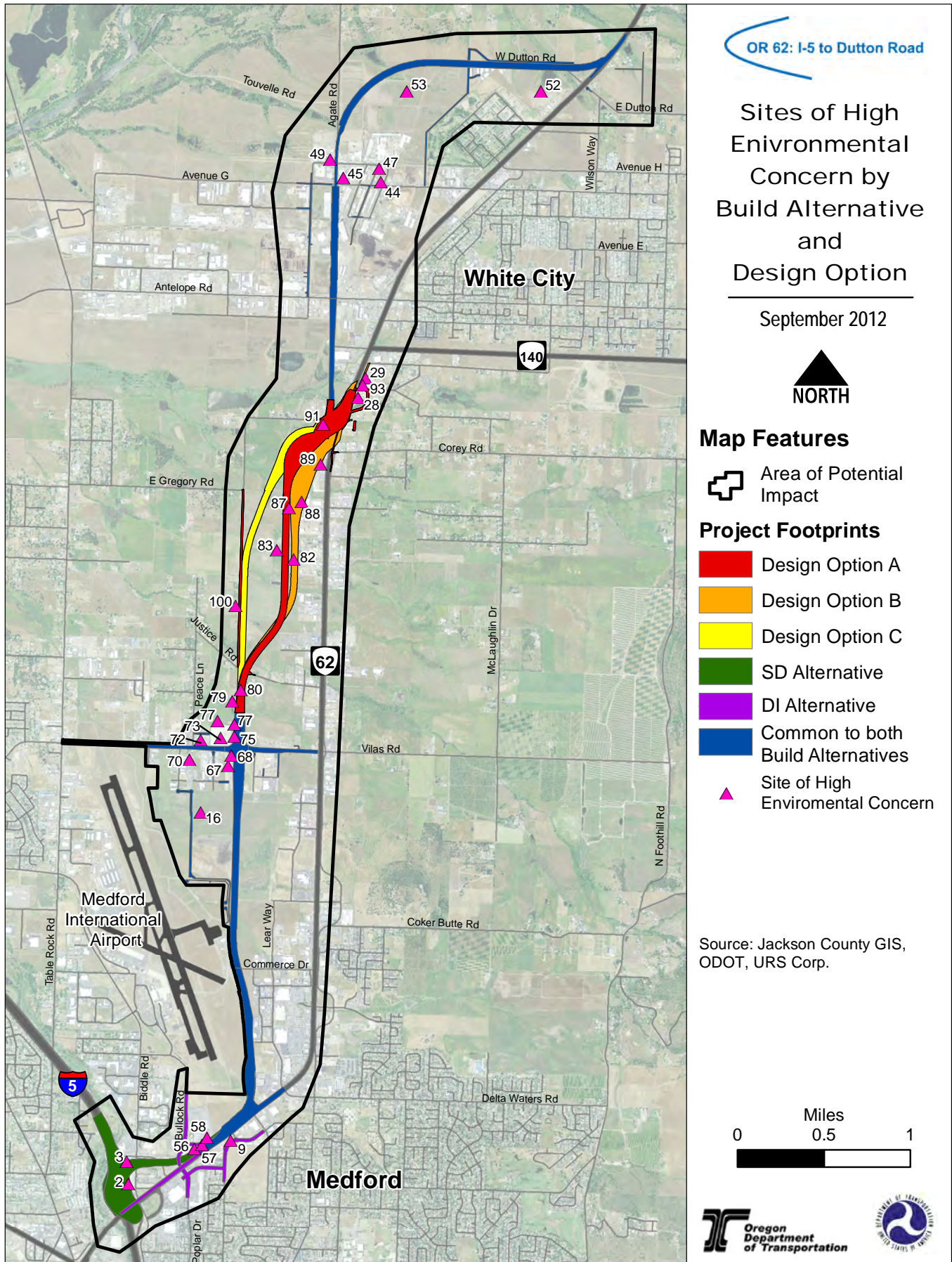


Figure 3.20-2 FEIS

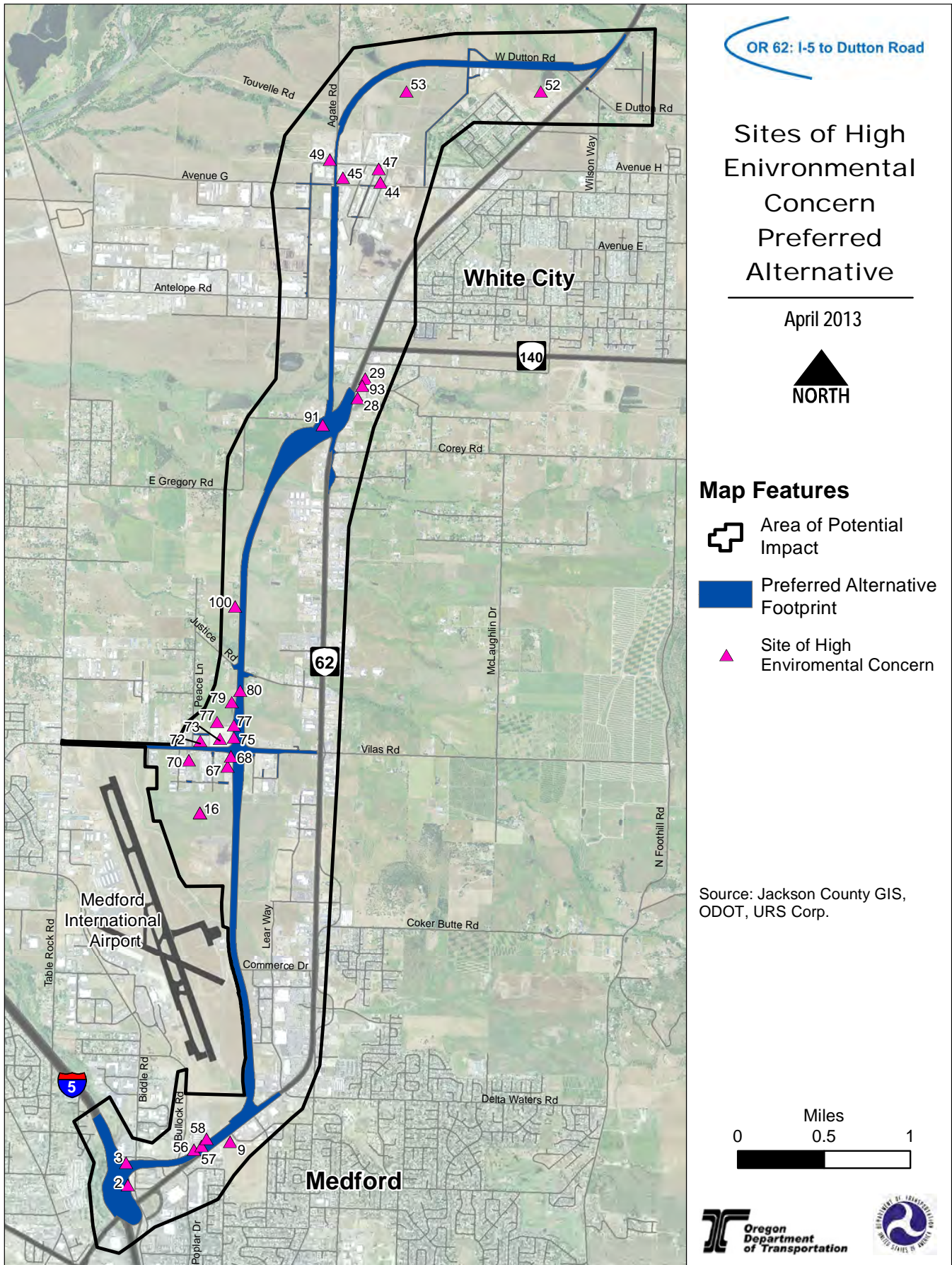


Figure 3.20-3

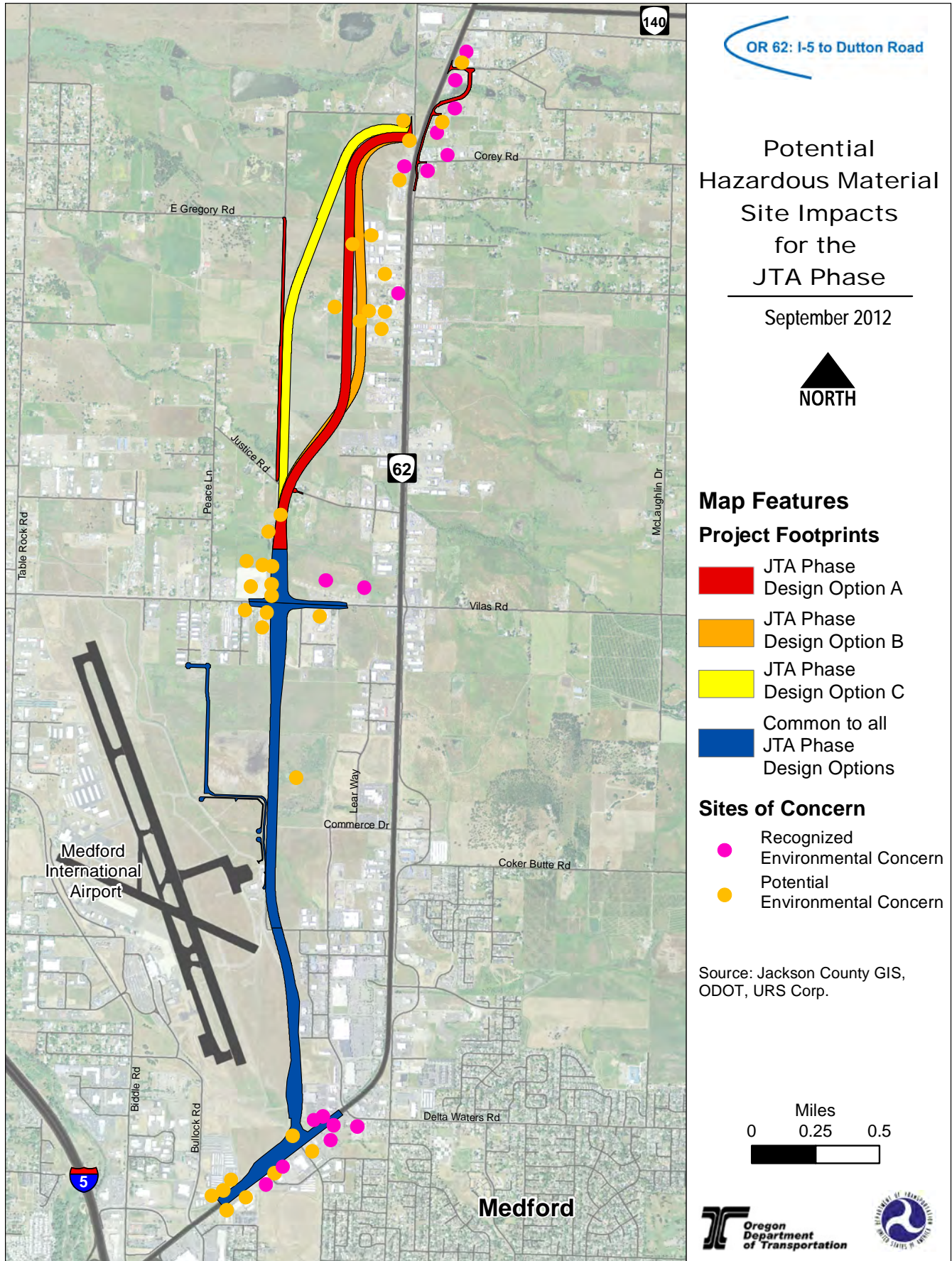


Figure 3.20-3 FEIS

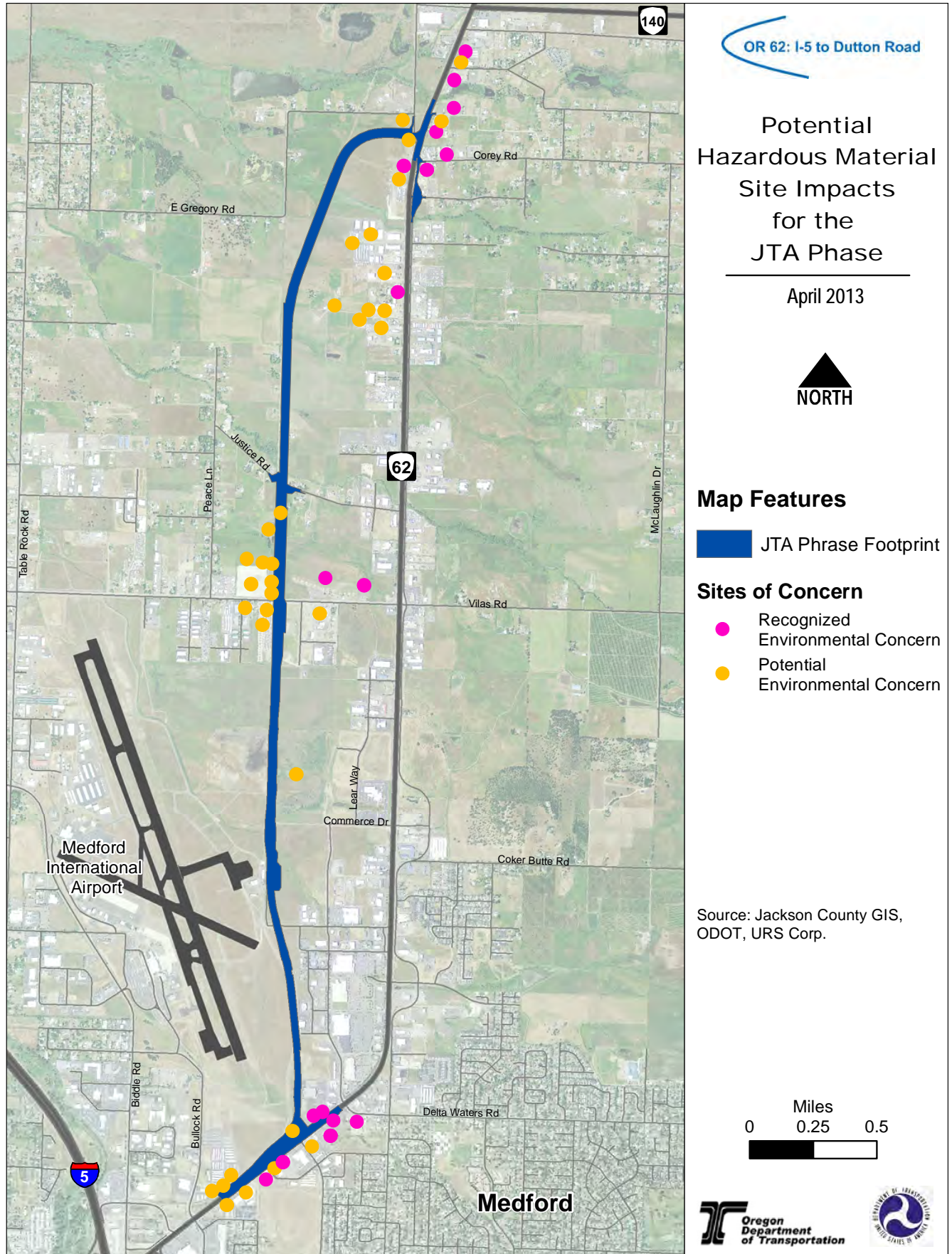


Figure 3.20-4

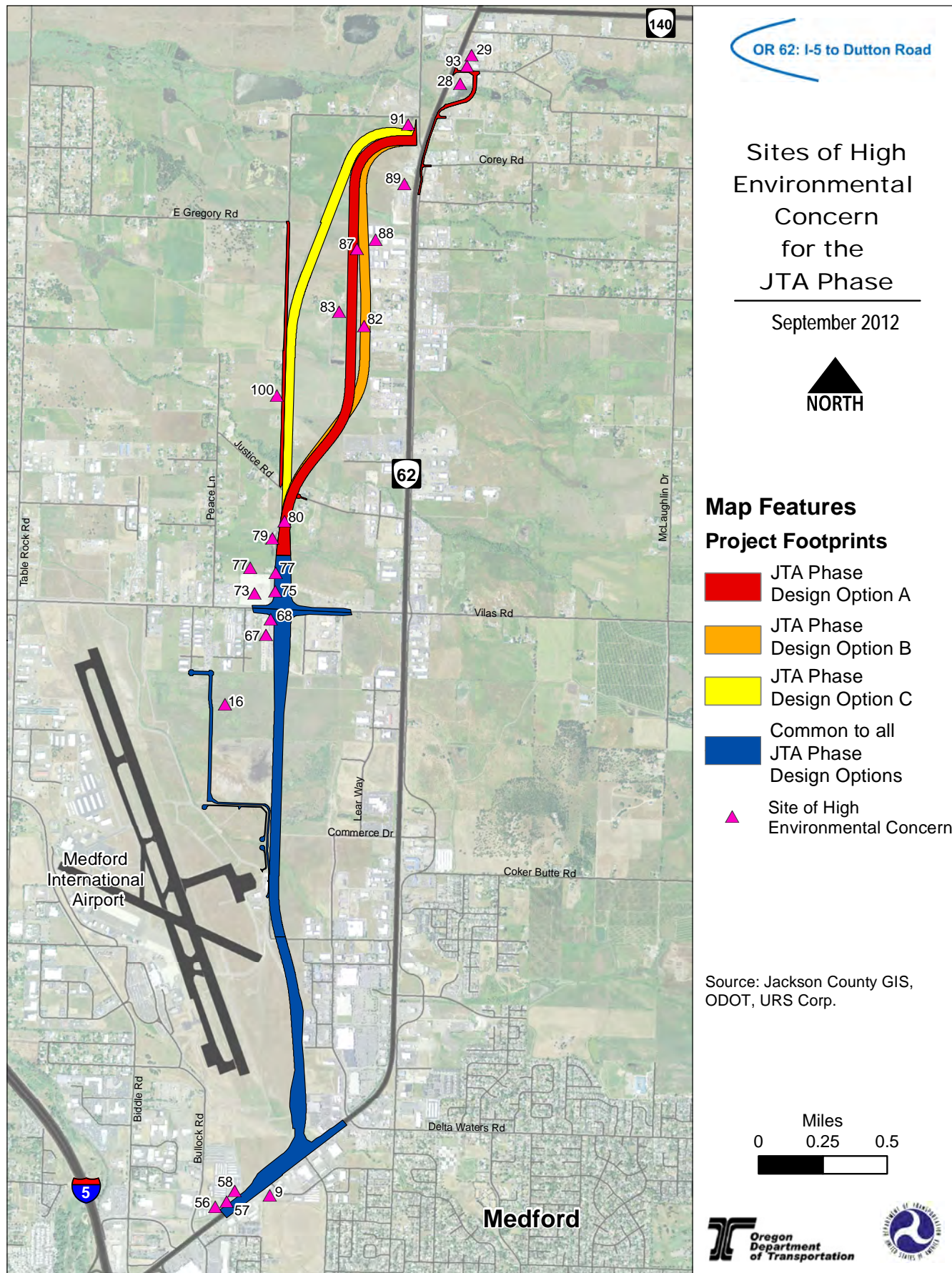


Figure 3.20-4 FEIS

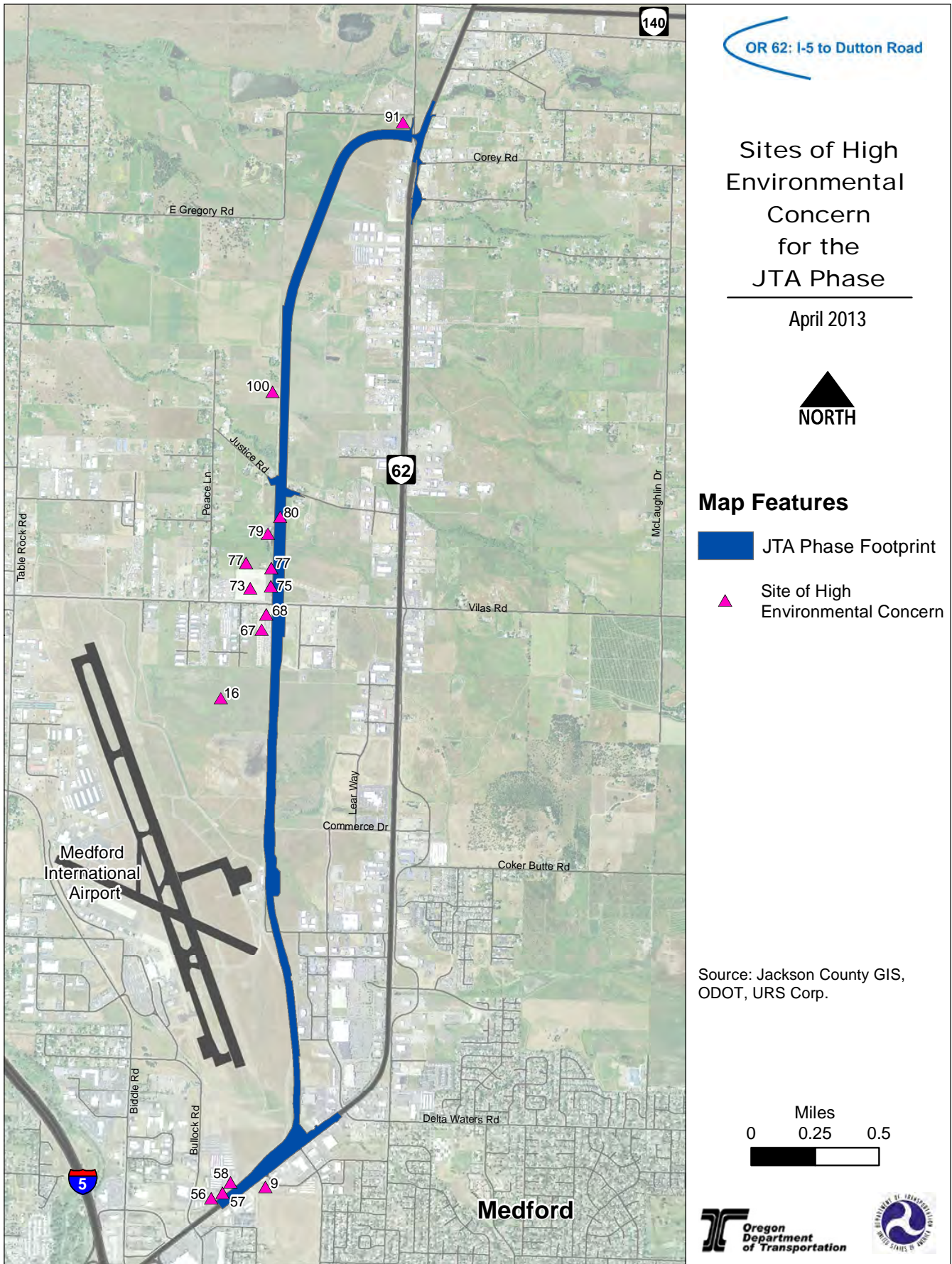


Table 3.20-3 Summary of Hazardous Materials Impacts, JTA Phase

	Option A	Option B	Option C (Preferred Alternative)
Recognized Environmental Concerns			
Low	6	6	6
Moderate	7	7	7
High	1	1	1 0
Potential Environmental Concerns			
Low	10	11	12
Moderate	11	11	11
High	15	14	13 11
Total Sites of Concern			
Low	16	17	18
Moderate	18	18	18
High	16	15	14 11

Source: Hazardous Material Technical Report

3.20.3.2 Indirect Impacts

No Build Alternative

As described in Section 3.2, build-out of the land within existing UGBs of Medford and Eagle Point and the White City UUCB would likely occur under the No Build Alternative, but plan amendments and zone changes to allow larger-scale development would be constrained. Excavation for land development can have the same beneficial and non-beneficial impacts on hazardous materials sites as excavation for road construction, as described below.

Build Alternatives, Design Options, and JTA Phase

Project activities could potentially have both beneficial and non-beneficial indirect impacts from hazardous materials sites.

The potentially beneficial indirect impacts include: (1) increased public safety and positive impacts on the environment associated with removal of the environmental contaminants in the API, (2) improved understanding of existing subsurface conditions from subsurface investigations, and (3) enhanced assessment of property values within the API as a result of subsurface investigations.

The potentially non-beneficial indirect impacts consist of: (1) possible long-term exposure of hazardous materials to the public and environment as a result of project construction and (2) possible re-mobilization of existing contaminated soil and groundwater due to subsurface excavation, and (3) potential exposure of hazardous materials to workers.

The magnitude and extent of these indirect impacts depends on the number of moderate and high ranked SOC's impacted by each build alternative, design option, and phase, as summarized above in Table 3.20-1 and Table 3.20-3.

Additionally, as described in Section 3.2, Land Use, the build alternatives and JTA phase would likely accelerate land development allowed by the Medford, Eagle Point, and Jackson County comprehensive plans, including within the White City UUCB, and reduce constraints on plan amendments and zone changes to allow larger-scale development within the Medford and Eagle Point UGBs. Excavation for land development can have the same beneficial and non-beneficial impacts on hazardous materials sites as excavation for road construction, as described above.

3.20.3.3 Construction Impacts

No Build Alternative

Under the No Build Alternative, there would be no construction impacts from hazardous materials.

Build Alternatives, Design Options, and JTA Phase

During construction, some of the listed REC and PEC sites could be disturbed. Construction impacts could include: (1) possible human safety issues due to short-term exposure to contaminated soil and ground water, (2) cleanup and disposal of contaminated areas, (3) release of hazardous materials from construction staging areas, such as petroleum products, (4) increased project costs and (5) delayed construction schedule when unanticipated hazardous materials are discovered.

The magnitude and extent of these impacts depends on the number of moderate and high ranked SOC's impacted by each build alternative, design option, and phase, as summarized above in Table 3.20-1 and Table 3.20-3.

There is a possibility of undiscovered environmental concern within the API that has not yet been identified as an area of concern. During subsurface excavation, these sites may be exposed. Construction personnel should contact the ODOT Region 3 Hazardous Material Specialists and refer to the construction contractor's Contaminated Media Management Plan (CMMP) if exposure of an unidentified environmental concern occurs. The CMMP will be developed by the contractor and approved by ODOT prior to commencement of work.

3.20.4 Avoidance, Minimization, and/or Mitigation Measures

Avoidance, minimization, and mitigation measures for hazardous materials would be implemented for either build alternative and are described below.

3.20.4.1 Minimization and Avoidance Measures

As part of the property acquisition process, after completion of the NEPA phase, a Level 2 Preliminary Site Investigation (PSI) would be completed for properties with known potential for hazardous materials or for properties where the potential is not known. The Level 2 PSI is intended to minimize or avoid impacts. The Level 2 PSI would include: (1) subsurface soil and groundwater sampling, (2) descriptions of likely contamination types, concentrations, extents, and possible transport mechanisms, (3) characterization of existing subsurface conditions, (4) estimates of volume and costs of disposing contaminated subsurface material, (5) identification of likely impacts on project activities, and (6) mitigation actions needed to minimize or eliminate potential impacts. In addition to performing the PSI, a CMMP would be prepared and incorporated into construction bid documents and implemented for project construction activities, specifically near areas of known or potential contamination. Budget estimates for these measures would be determined after the Preferred Alternative is identified.

3.20.4.2 Mitigation Measures

Complete site remediation would be considered, as necessary, pending results of the Level 2 assessment and right-of-way negotiations. The following actions could be used to mitigate impacts:

- Review and evaluate information in the Level 2 assessment report to identify parcels where hazardous materials are known to exist or may be present. This would reduce liability risks of acquiring and/or leasing land containing hazardous waste.
- Prior to acquisition and/or leasing, contact appropriate regulatory agencies to determine whether more recent information is available, and whether further assessment of the parcels is scheduled.
- Enter into an agreement with DEQ, such as a prospective purchase agreement to lessen future liabilities resulting from purchasing impacted properties.

- Develop emergency response procedures, consistent with existing laws and regulations for use by ODOT personnel and the construction contractor in the unlikely event of a major hazardous materials release.
- Plan, design, and implement controls and measures to avoid further exacerbation of impacted sites. Plans and procedures would be prepared to prevent future releases or spills.
- Design a work plan for hazardous materials. The plan would include actions to be implemented if construction activities encounter impacted soil and/or groundwater, accident prevention, and procedures to divert spilled materials away from surface water resources.
- Develop a Health and Safety Plan for all construction activities consistent with applicable laws in effect at the time of construction to account for potential exposure of hazardous materials to workers.

For all facilities or residences in the vicinity that would be relocated, or demolished, the DEQ would be contacted to assure proper handling and disposal of regulated materials (i.e., asbestos or lead containing materials). The work would be completed in accordance with the appropriate laws, rules, and regulations.

- ODOT and its contractors would comply with all applicable federal, state, and local laws and regulations as they pertain to the storage, handling, management, transportation, disposal, and documentation of hazardous substances (as defined in ORS 465.200), oil and hazardous materials (as defined in OAR 340-108-0002), and hazardous waste (as defined in 40 CFR 258, ORS 459 and OAR 340).

3.20.5 Avoidance, Minimization, and/or Mitigation Commitments Incorporated into the Preferred Alternative

ODOT makes the following commitments.

JTA Phase

There are no mitigation commitments exclusive to the JTA phase.

JTA Phase and Preferred Alternative Subsequent to Construction of the JTA Phase

- ODOT will complete a Level 2 Preliminary Site Investigation (PSI) for all purchased properties which the Level 1 Site Investigation identified as having known hazardous materials or the potential for hazardous materials.
- ODOT will prepare a Contaminated Media Management Plan (CMMP) and incorporate it into construction bid documents and implement the CMMP for project construction activities, specifically near areas of known or potential contamination.
- Pending results of the Level 2 PSI and right-of-way negotiations, ODOT will consider complete site remediation as necessary.
- For all facilities or residences that would be relocated or demolished, ODOT will coordinate with DEQ to assure proper handling and disposal of regulated materials.

Preferred Alternative Subsequent to Construction of the JTA Phase

There are no mitigation commitments exclusive to the Preferred Alternative.